STRATEGY FOR RECOVERY

A core area represents the closest approximation of a biologically functioning unit for bull trout. The combination of core habitat (*i.e.*, habitat that could supply all elements for the long-term security of bull trout, including for both spawning and rearing, as well as for foraging, migrating, and overwintering) and a core population (*i.e.*, bull trout inhabiting a core habitat) constitutes the basic core area unit on which to gauge recovery within a recovery unit.

In the Clark Fork Recovery Unit (Table 2), core areas were most easily delineated for adfluvial populations (*e.g.*, typically the lake where adults reside and interconnected watershed upstream). For fluvial or anadromous populations, delineating core areas requires that some judgment calls be made in determining the extent of historical and current connectivity of migratory habitat, while considering natural and manmade barriers, survey and movement data, and genetic analysis. For resident populations, we must consider whether local populations are remnants from previously existing migratory bull trout and whether reconnecting fragmented habitat would restore a migratory core area. Overall, the hierarchy of population units was mutually exclusive both within a level (*e.g.*, core areas did not overlap) and among levels (*e.g.*, a core area did not occur within portions of more than one recovery unit or subunit).

Table 2. List of local populations (in bold) by core area, in the Clark Fork Recovery Unit. Streams designated by (mc) are migratory corridors only and are not considered to host their own local population.

RECOVERY UNIT AND SUBUNIT	CORE AREA	LOCAL POPULATION
Clark Fork RU Upper Clark Fork RSU	Clark Fork River Section 1 (Upstream of Milltown Dam)	**Clark Fork River** **Warm Springs Creek** **Racetrack Creek** **Little Blackfoot River** **Flint Creek** **Boulder Creek** **Harvey Creek**
	Rock Creek	**Rock Creek** **Middle Fork Rock Creek** **East Fork Rock Creek** **West Fork Rock Creek** **Ross Fork Rock Creek** **Upper Willow Creek** **Stony Creek** **Wyman Creek** **Hogback Creek** **Cougar Creek** **Wahlquist Creek** **Butte Cabin Creek** **Welcome Creek** **Ranch Creek** **Brewster Creek** **Gilbert Creek**
	Blackfoot River	**Blackfoot River** **Landers Fork** **North Fork Blackfoot River** **Monture Creek** **Cottonwood Creek** **Belmont Creek** **Gold Creek**
	Clearwater River and Clearwater lake chain	**Clearwater River** (upstream of Salmon Lake) **West Fork Clearwater River** **Deer Creek** **Morrell Creek** Owl Creek (mc) **Placid Creek**

RECOVERY UNIT AND SUBUNIT	CORE AREA	LOCAL POPULATION
	Clark Fork River Section 2 (Milltown Dam to Flathead River)	Clark Fork River (mc) **Rattlesnake Creek** **Petty Creek** **Fish Creek** **Trout Creek** **Cedar Creek** **St. Regis River**
	West Fork Bitterroot River	**All tributaries** upstream of Painted Rocks Dam
	Bitterroot River	**West Fork Bitterroot River** (downstream of Painted Rocks) **East Fork Bitterroot River** **Warm Springs Creek** **Bitterroot River** **Sleeping Child Creek** **Skalkaho Creek** **Blodgett Creek** **Fred Burr Creek** **Burnt Fork Creek**
Clark Fork RU Lower Clark Fork RSU	Lower Flathead River	Mission Creek (mc) **Post Creek** (trib. to McDonald Lake) **Mission Creek** (trib. to Mission Reservoir) **Dry Creek** (trib. to Tabor (St. Marys) Res.) **Jocko River** **South Fork Jocko River** **Middle Fork Jocko River** **North Fork Jocko River**
	Clark Fork River Section 3 (Flathead River to Thompson Falls Dam)	Clark Fork River (mc) Thompson River (mc) **Fishtrap Creek** **West Fork Thompson River**
	Noxon Rapids Reservoir	**Prospect Creek** **Graves Creek** **Vermillion River**
	Cabinet Gorge Reservoir	**Rock Creek** **Bull River**

RECOVERY UNIT AND SUBUNIT	CORE AREA	LOCAL POPULATION
	Lake Pend Oreille (LPO)	**Clark Fork River** **Twin Creek** **Lightning Creek** **Rattle Creek** **Wellington Creek** **Porcupine Creek** **East Fork Lightning Creek** **Johnson Creek** (trib. to LPO) **Gold Creek** (trib. to LPO) **North Gold Creek** (trib. to LPO) **Granite Creek** (trib. to LPO) **Trestle Creek** (trib. to LPO) **Pack River** (trib. to LPO) **Grouse Creek** **Priest River** East River (mc) Middle Fork East River (mc) Uleda Creek Tarlac Creek
Clark Fork RU Flathead RSU	Frozen Lake	**Unnamed headwater tributary** (and stream flowing out of Frozen Lake)
	Upper Kintla Lake	**Kintla Creek** (trib. to Upper Kintla Lake)
	Kintla Lake	**Kintla Creek** (trib. to Kintla Lake)
	Akokala Lake	**Akokala Creek** (trib. to Akokala Lake)
	Bowman Lake	**Bowman Creek** (trib. to Bowman Lake)
	Cerulean Lake Quartz Lake Middle Quartz Lake	**Quartz Creek** (trib. to Middle Quartz Lake)
	Lower Quartz Lake	**Quartz Creek** (trib. to Lower Quartz Lake)
	Cyclone Lake	**Cyclone Creek** (entire drainage)
	Logging Lake	**Logging Creek** (trib. to Logging Lake)
	Trout Lake	**Camas Creek** (trib. to Trout Lake)
	Arrow Lake	**Camas Creek** (trib. to Arrow Lake)
	Isabel Lake(s)	**Park Creek** (trib. to Lower Isabel Lake)
	Harrison Lake	**Harrison Creek** (trib. to Harrison Lake)
	Lincoln Lake	**Lincoln Creek** (trib. to Lincoln Lake)

RECOVERY UNIT AND SUBUNIT	CORE AREA	LOCAL POPULATION
	Lake McDonald	**McDonald Creek** (trib. to Lake McDonald)
	Doctor Lake	**Doctor Creek** (trib. to Doctor Lake)
	Big Salmon Lake	**Big Salmon Creek** (trib. to Big Salmon Lake)
	Hungry Horse Reservoir	South Fork Flathead River (mc) **Danaher Creek** **Youngs Creek** **Gordon Creek** **White River** **Little Salmon Creek** **Bunker Creek** **Spotted Bear River** **Sullivan Creek** (trib. Hungry Horse Res.) **Wheeler Creek** (trib. H. Horse Res.) **Wounded Buck Creek** (trib. H. Horse Res.)
	Upper Stillwater Lake	**Stillwater River** (trib. to Upper Stillwater Lake)
	Whitefish Lake	**Swift Creek** (trib. to Whitefish Lake)
	Upper Whitefish Lake	**East Fork Swift Creek** (trib. and downstream)
	Lindbergh Lake	**Swan River** (trib. to Lindbergh Lake)
	Holland Lake	**Holland Creek** (trib. to Holland Lake)
	Swan Lake	Swan River (mc) **Elk Creek** **Cold Creek** **Jim Creek** **Piper Creek** **Lion Creek** **Goat Creek** **Woodward Creek** **Soup Creek** **Lost Creek**

RECOVERY UNIT AND SUBUNIT	CORE AREA	LOCAL POPULATION
	Flathead Lake	Flathead River (mc) **North Fork Flathead River** (U.S. / B.C.) **Howell Creek** (B. C.) **Kishinehn Creek** (B. C.) **Trail Creek** **Whale Creek** **Red Meadow Creek** **Coal Creek** **Big Creek** Middle Fork Flathead River (mc) **Strawberry Creek** (includes Trail) **Bowl Creek** **Clack Creek** **Schafer Creek** (includes Dolly Varden) **Morrison Creek** (Includes Lodgepole) **Granite Creek** **Long Creek** **Bear Creek** **Ole Creek** **Park Creek** **Nyack Creek**
Clark Fork RU Priest RSU	Priest Lakes	**Upper Priest River** **Hughes Fork** **Gold Creek** **Trapper Creek** (trib. to Upper Priest Lake) **Lion Creek** (trib. to Priest Lake) **Two Mouth Creek** (trib. to Priest Lake) **Granite Creek** (trib. to Priest Lake) **North Fork Granite Creek** **South Fork Granite Creek** **Indian Creek** (trib. to Priest Lake) **Kalispell Creek** (trib. to Priest Lake) **Soldier Creek** (trib. to Priest Lake)

Recovery Goals and Objectives

The specific goal of the bull trout recovery plan is to **ensure the long-term persistence of self-sustaining, complex, interacting groups of bull trout distributed throughout the Clark Fork River basin so that the species can be delisted.** Specifically, the recovery subunit teams for the four Clark Fork River subunits (Upper Clark Fork, Lower Clark Fork, Flathead, and Priest) adopted the goal of **a sustained net increase in bull trout abundance, and increased distribution of some local populations, within existing core areas in this recovery unit (as measured by standards accepted by the recovery subunit teams, often referred to collectively as the Clark Fork Recovery Unit Teams).**

- Maintain current distribution of bull trout and restore distribution in previously occupied areas within the Clark Fork Recovery Unit.
- Maintain stable or increasing trends in abundance of bull trout in each subunit of the Clark Fork Recovery Unit.
- Restore and maintain suitable habitat conditions for all bull trout life history stages and strategies.
- Conserve genetic diversity and provide opportunity for genetic exchange.

Within that general guidance, the Clark Fork Recovery Unit Teams developed specific recovery criteria for the Clark Fork Recovery Unit. Bull trout are distributed among about 150 local populations within 38 core areas of the recovery unit (see Table 2). As more information on fish distribution and genetics is collected and analyzed, the number of local populations identified will probably increase. In this recovery unit, the historical distribution of bull trout is relatively intact, and no vacant core habitat is recommended at this time for reestablishment of extirpated local populations. Instead, emphasis is placed on securing the existing distribution within core areas and increasing the abundance and connectivity of local populations.

The Upper Clark Fork, Lower Clark Fork, Flathead, and Priest Subunit Recovery Teams adopted the following objective for the Clark Fork Recovery Unit:

> **A sustained net increase in bull trout abundance, and increased distribution of some local populations, within existing core areas in this recovery unit (as measured by standards that the Clark Fork Recovery Unit Teams develop).**

To assess progress toward this objective, each recovery subunit team adopted recovery criteria for its respective subunit. Relevant numerical standards are presented in Table 3. The standards for adult abundance, presented in Table 3, are based in part on recent historical information about the size of the adult population, as well as its potential, given the extent of the interconnected watershed.

Inherent stochastic, as well as genetic, risks are broadly acknowledged to be associated with low population levels of any species, but, to date, there has been a great deal of uncertainty about the proper application of theoretical population standards to bull trout. Rieman and Allendorf (2001) proposed that 1,000 spawning adults is a cautious management goal for long-term maintenance of genetic variation in a core area population of bull trout. The Clark Fork Recovery Unit Teams estimate that, of the 38 core areas identified in the Clark Fork Recovery Unit, only about 10 core areas have the potential to support 1,000 or more adult bull trout, even under recovered conditions.

Based in part on the analysis of Rieman and Allendorf (2001), the Clark Fork Recovery Unit Teams also assumed that a core area cannot maintain genetic viability for even the short term with spawning populations of fewer than roughly 100 adults. Rieman and Allendorf (2001) concluded that a cautious interpretation would be that approximately 100 adult bull trout, spawning each year, would be required to minimize the risk of inbreeding in a population. For some of the isolated core areas in the Clark Fork Recovery Unit, even this level of population abundance will be difficult to attain.

Table 3. Numeric standards necessary to achieve recovered abundance of bull trout in primary and secondary core areas of the Clark Fork Recovery Unit of the Columbia River drainage

CORE AREAS	Existing Number (Estimated) Local Populations	Existing Number (Estimated) Local Populations with > 100	Recovered Minimum Number Local Populations with > 100	Recovered Minimum Number Core Area Total Adult Abundance
PRIMARY **Upper Clark Fork River Complex** (Sections 1 and 2 combined)	13	0	5	1,000
Rock Creek	14	2	5	1,000
Blackfoot River	7	3	5	1,000
Bitterroot River	9	2	5	1,000
Lower Clark Fork River Complex (Clark Fork River Section 3, Lower Flathead River, Noxon Reservoir, and Cabinet Gorge Reservoir)	16	0	5	1,000
Lake Pend Oreille	14	3	6	2,500
Flathead Lake	19	9	10	2,500
Swan Lake	9	7	5	2,500
Hungry Horse Reservoir	10	5	5	1,000
Priest Lakes	12	0	5	1,000
TOTAL - PRIMARY CORES	**123**	**31**	**56**	**14,500**
SECONDARY - Clearwater River	5	0	1	Maximize with goal of > 100 in each
West Fork Bitterroot	1	1	1	
Flathead Disjuncts (22 separate adfluvial cores)	22 (1 each)	1	22 (1 each)	
TOTAL - SECONDARY CORES	**28**	**2**	**24**	**2,400**

The numerical criteria proposed by the Clark Fork Recovery Unit Teams to ensure replication of populations and to function as minimum recovery standards for adult abundance of bull trout in the Clark Fork Recovery Unit (Table 3) are based in part upon Rieman and Allendorf's (2001) estimates of the minimum population levels required for maintaining long-term genetic variability (1,000 adults) and genetic viability (100 adults). However, the Clark Fork Recovery Unit Teams also used the best professional scientific judgment of their members in setting those standards. At this time, the proposed recovery standards are based primarily on genetic concerns. Over time, protection of other ecological and biological attributes that contribute to population viability and long-term population stability will also need to be considered. Rieman and Allendorf (2001) cautioned that the guidelines they presented represent conservative minimum standards for the conservation of genetic variability and not "goals that will assure the viability of any population." They also noted that mitigation of extinction threats associated with demographic processes may require larger population sizes regardless of the genetic issues. They concluded that maintaining genetic diversity is essential, but not necessarily sufficient, for effective conservation.

It must be noted, however, that many of the small isolated populations in the Clark Fork Recovery Unit (defined below as secondary core areas) are essentially stranded local populations that have apparently persisted for a very long time, even thousands of years, at population levels very similar to current levels. Most such populations will continue to exist at a high degree of genetic risk and will be subject to high risk of extirpation from stochastic events. As more numerical data are collected and as trends are more clearly documented, the abundance standards should be further refined in their application as recovery criteria.

For purposes of recovery in this unit, the Clark Fork Recovery Unit Teams divided the entire unit into primary and secondary core areas, based mostly on the size, connectedness, and complexity of the watershed. The distinction between primary and secondary core areas indicates that a different set of standards are needed for recovery criteria, particularly for addressing abundance. The distinction does not infer a different level of importance for recovery purposes.

Primary Core Areas: Primary core areas in the Clark Fork Recovery Unit are typically located in watersheds of major river systems, often contain large lakes or reservoirs, and have migratory corridors that usually extend 50 to 100 kilometers (30 to 60 miles) or more. Each primary core area includes 7 to 19 identified local populations of bull trout. In recovered condition, a primary core area is expected to support at least 5 local populations with 100 or more adults each and to contain 1,000 or more adult bull trout in total.

The following areas have been designated as primary core areas in the Clark Fork Recovery Unit:

1. **Upper Clark Fork River** (includes two currently fragmented population segments, upstream and downstream of Milltown Dam, that are currently treated as separate core areas). Note that these core areas were historically connected and must be functionally rejoined under recovered conditions.

2. **Rock Creek**

3. **Blackfoot River**

4. **Bitterroot River**

5. **Lower Clark Fork River** (includes four currently fragmented population segments: Lower Flathead River, Thompson Falls Reservoir, Noxon Reservoir, and Cabinet Gorge Reservoir; these segments are currently treated as separate core areas). Note that these core areas were historically connected and must be functionally rejoined under recovered conditions.

6. **Lake Pend Oreille**

7. **Priest Lakes and Priest River**

8. **Flathead Lake**

9. **Swan Lake**

10. **Hungry Horse Reservoir**

Secondary Core Areas: Secondary core areas are based in smaller watersheds and typically contain adfluvial populations of bull trout that have become naturally isolated, with restricted upstream spawning and rearing habitat extending less than 50 kilometers (30 miles). Each secondary core areas includes one identified local population of bull trout (the Clearwater River is an exception, with as many as five local populations) and is not believed to contain sufficient size and complexity to accommodate 5 or more local populations with 100 or more adults to meet the abundance criteria defined above for primary core areas. Most secondary core areas have the potential to support fewer than a few hundred adult bull trout, even in a recovered condition. In extreme cases, secondary core areas may include small isolated lakes that occupy as little as 10 surface hectares (25 acres) and that are connected to 100 meters (about 100 yards) or less of accessible spawning and rearing habitat. In most cases, these conditions are natural, and, in some situations, these bull trout have probably existed for thousands of years with populations that seldom exceed 100 adults.

Collectively, the 24 secondary core areas may support a broad range of the genetic and phenotypic diversity that is representative of bull trout in the Clark Fork Recovery Unit.

The following areas have been designated as secondary core areas for the Clark Fork Recovery Unit:

1. **Clearwater River** and associated chain of lakes

2. **West Fork Bitterroot River** upstream of Painted Rocks Dam

3.–24. **22 lakes in the Flathead Recovery Subunit** (see Table 2)

It is noted that, for the portions of these watersheds in Montana, the primary core areas are functionally equivalent to the Restoration/Conservation Areas (also known as RCAs) designated by the Montana Bull Trout Restoration Team 2000. The secondary core areas generally represent the waters referred to as "disjunct" by the Montana Scientific Group.

Recovery Criteria

Listed below are the proposed recovery criteria for the Clark Fork Recovery Unit. As for the objectives identified in Chapter 1, the intent of recovery criteria within this recovery unit is to maximize the likelihood of persistence. Such persistence will be achieved, in part, by seeking to perpetuate the current distribution and by maintaining or increasing abundance of all local bull trout populations that are currently identified in the Clark Fork Recovery Unit (Table 2). Numerical summary of the recovery criteria is presented in Table 3.

Achieving the recovery criteria, including increasing monitoring and evaluation, will require the cooperative efforts of State, Federal, and Tribal resource management agencies; government and private landowners and water users; conservation organizations; and other interested parties. Criteria will only be achieved through reducing threats to bull trout, in part as a result of implementing tasks identified in the Recovery Measures Narrative section of this recovery plan, as well as by taking advantage of other new conservation and recovery opportunities as they arise.

1. **Distribution criteria will be met when the total number of identified local populations (currently numbering about 150) has been maintained or increased and when local populations remain broadly distributed in all existing core areas (Table 2).** This criteria must be applied with enough flexibility to allow for adaptive changes in the list of local populations (both additions and subtractions), based on best available science, as the body of knowledge concerning population and genetic inventory grows. It is also accepted that some secondary core areas may be at high risk of, or are currently undergoing, extirpation.

The distribution criteria cannot be met if major gaps develop in the current distribution of bull trout in the primary core areas of the Clark Fork Recovery Unit. Reconnecting fragmented habitat, as well as documenting new or previously undescribed local populations, should allow the documented distribution of bull trout to increase as recovery progresses. An exception to such an increase may occur in the Flathead Recovery Subunit where historical distribution is nearly intact.

The intention of the Clark Fork Recovery Unit Teams is also to maintain the existing bull trout distribution within all secondary core areas, but the teams recognize that stochastic events or deterministic processes already occurring are likely to cause a loss of distribution in some cases. The significance of such losses in the ultimate determination of whether or not distribution criteria have been met need to be judged on a case-by-case basis.

2. **Abundance criteria will be met when, in all 10 primary core areas, each of at least 5 local populations contain more than 100 adult bull trout. In the Lake Pend Oreille Core Area, each of at least 6 local populations must contain more than 100 adult bull trout. In the Flathead Lake Core Area, each of at least 10 local populations must contain more than 100 adult bull trout. In each of the 10 primary core areas, the total adult bull trout abundance, distributed among local populations, must exceed 1,000 fish; total abundance must exceed 2,500 adult bull trout in Lake Pend Oreille, Flathead Lake, and Swan Lake.**

Lake Pend Oreille, Flathead Lake, Swan Lake. These three core areas represent the largest natural adfluvial populations of bull trout in the Clark Fork Recovery Unit and perhaps the largest within the species' range in the United States. Each of these lakes has consistently supported spawning populations of adfluvial bull trout that produce over 500 redds annually in the currently connected portions of its watershed. Higher standards established for these three core areas reflect their higher biological potential, as well as their significance in maintaining high population levels, to conserve genetic variability within this recovery unit. These higher standards are based, in part, upon professional scientific judgment after evaluation of the existing 20 years of data for these waters.

In Lake Pend Oreille, 13 relatively complete basinwide redd counts were conducted between 1983 and 2000. These counts found an average of 657 redds in 18 streams (range 412 to 881). The 2000 redd count located 740 redds. Five drainages (Grouse, Gold, Granite, Trestle, and Lightning Creeks) consistently support over 25 redds, with the strongest (Gold and Trestle Creeks) normally exceeding 100 redds each. Johnson Creek also exceeded the 25 redd level in two of the 4 years between 1997 and 2000.

In Flathead Lake, 7 basinwide bull trout redd counts, conducted in 30 streams across 24 drainages between 1980 and 2000, found an average of 628 redds (range 236 to 1,156). The most recent basinwide count in 2000 found 555 bull trout redds, reflecting a rebounding trend from lows of the 1990's. Nine drainages (Big, Coal, Whale, Trail, and Howell [British Columbia] Creeks in the North Fork Flathead watershed and Ole, Morrison, Schafer, and Strawberry Creeks in the Middle Fork Flathead watershed) averaged 25 redds or more during the 21-year survey period, and several more drainages approached that level.

In the Swan Lake Core Area, basinwide redd counts were conducted annually between 1995 and 2000 and found an average of 752 bull trout redds in 10 streams across 8 drainages. Redd counts ranged from 703 to 861 during that period, and 717 redds were counted in 2000. Five drainages (Woodward, Goat, Lion, Jim, and Elk Creeks) consistently produced redd counts of 50 to 250 redds each, and 2 additional streams (Lost and Cold Creeks) produce about 20 to 30 redds.

Conversion of redd counts or other indices to adult numbers should be developed on a case-by-case basis, using the best available science and conversion factors that may be unique to each population. In many adfluvial populations, alternate-year spawning appears to be the norm. On the other hand, when Carnefix *et al.* (2001) used radio telemetry to track movements of 96 bull trout in the Rock Creek core area over a 3-year period, they concluded that nearly all of the fish they followed spawned annually.

Remaining Seven Primary Core Areas. In the other seven primary core areas, there are generally insufficient data over too short a period of record to provide a statistical analysis of abundance. Flathead, Pend Oreille, and Swan Lakes are thought to

represent unique situations because of the high number of extant local populations of adfluvial origin, and these lakes may not reflect the norm for the other seven primary core areas in the Clark Fork Recovery Unit. The standard criteria we have adopted for the remaining core areas are 5 local populations with 100 or more adults each and 1,000 or more adults in total.

The default abundance criteria for primary core areas—five local populations with 100 or more adults and 1,000 or more adult fish in total—is designed to protect genetic integrity and to reduce chances of stochastic extirpation by replicating local populations in these core areas. As more information becomes available, the default criteria for each primary core area should be evaluated and may be adjusted to reflect that new information. The recovery unit teams emphasize that these criteria must be adaptive if we are to fully protect and restore bull trout in this recovery unit.

> **The abundance criteria for 24 secondary core areas will be met when each of these core areas with the habitat capacity to do so supports at least 1 local population containing more than 100 adult bull trout and when total adult abundance in the secondary core areas collectively exceeds 2,400 fish.** Some of the weakest and smallest secondary core areas do not have sufficient habitat available to meet this criteria, even in a recovered condition, and these cases must be factored into the evaluation of whether or not these criteria have been attained.

Extirpation of bull trout in as many as one-fourth of the secondary core areas (6 or fewer) is expected to occur over the next 25 years, or is already in process, based upon the evaluation of existing trend and status information. This eventuality should not prevent overall abundance criteria from being attained if each of the primary core areas and the remaining secondary core areas (75 percent) meet their individual criteria. Reasonable recovery efforts must continue in all primary and secondary core areas to minimize the chance of local extirpations. Consideration must be given to using whatever means necessary to maintain or restore at-risk populations to protect the genetic and phenotypic diversity that these core areas represent in the Clark Fork Recovery Unit.

3. **Trend criteria will be met when the overall bull trout population in the Clark Fork Recovery Unit is accepted, under contemporary standards of the time, to be stable or increasing, based on at least 10 years of monitoring data.**

4. **Connectivity criteria will be met when functional fish passage is restored or determined to be unnecessary to support bull trout recovery at Milltown, Thompson Falls, Noxon Rapids, Cabinet Gorge, and Priest Lake Dams and when dam operational issues are satisfactorily addressed at Hungry Horse, Bigfork, Kerr, and Albeni Falls Dams (as identified through license conditions of the Federal Energy Regulatory Commission and the Biological Opinion of the U.S. Fish and Wildlife Service).** Restoring connectivity so that the abundance and distribution requirements above can be met will probably require remedying additional passage barriers identified as inhibiting bull trout migration on smaller streams within the Clark Fork Recovery Unit. Restored connectivity of the mainstem Clark Fork River will consolidate six existing core areas, a result of fragmentation caused by the dams, into two (recovered) core areas in the upper and lower Clark Fork River.

   a) In the Upper Clark Fork Recovery Subunit, fish passage must be provided at Milltown Dam, or the dam must be removed and the migratory corridor restored (Federal Energy Regulatory Commission relicensing process).

   b) In the Lower Clark Fork Recovery Subunit, fish passage needs must be fully evaluated at Thompson Falls, Noxon, and Cabinet Gorge Dams and be provided where determined biologically feasible and necessary (Federal Energy Regulatory Commission license conditions). Additional concerns relating to water level manipulation and flow regulation through the operations of Kerr Dam (Federal Energy Regulatory Commission license conditions) and Albeni Falls Dam (USFWS 2000) must also be evaluated and mitigative or restorative actions implemented.

   c) In the Flathead Recovery Subunit, no major barriers currently require passage. Concerns related to water level manipulation and flow regulation

through the operations of Kerr (Federal Energy Regulatory Commission license conditions) and Hungry Horse (USFWS Biological Opinion) Dams must be resolved, and conditions established by Federal Energy Regulatory Commission relicensing of Bigfork Dam must be met.

d) In the Priest Recovery Subunit, fish passage needs must be fully evaluated at Priest Lake Dam (Federal Energy Regulatory Commission license), and year-round fish passage must be provided if determined biologically necessary.

In all recovery subunits, substantial gains in reconnecting fragmented habitat may be achieved by restoring passage over and around many of the barriers that are typically located on smaller streams, including water diversions, road crossings, and culverts. Such barriers on small streams are not listed individually in the recovery criteria. In fact, many have not been identified. But, they are collectively important to recovery, and some are highlighted in the recovery narrative portion of this plan. A list of all such barriers should be prepared in the first five years of implementation. Substantial progress must be made in providing passage over at least half of these sites, consistent with the protection of upstream populations of westslope cutthroat trout and other native fishes, to meet the bull trout recovery criteria for connectivity.

ACTIONS NEEDED

Recovery Measures Narrative

In this chapter and all other chapters of the bull trout recovery plan, the recovery measures narrative consists of a hierarchical listing of actions that follows a standard template. The first-tier entries are identical in all chapters and represent general recovery tasks under which specific (*e.g.*, third-tier) tasks appear when appropriate. Second-tier entries also represent general recovery tasks under which specific tasks appear. Second-tier tasks that do not include specific third-tier actions are usually programmatic activities that are applicable across the species' range; they appear in *italic type*. These tasks may or may not have third-tier tasks associated with them; see Chapter 1 for more explanation. Some second-tier tasks may not be sufficiently developed to apply to the recovery unit at this time; they appear in *a shaded italic type (as seen here)*. These tasks are included to preserve consistency in numbering tasks among recovery unit chapters and intended to assist in generating information during the comment period for the draft recovery plan, a period when additional tasks may be developed. Third-tier entries are tasks specific to the Clark Fork Recovery Unit. They appear in the Implementation Schedule that follows this section and are identified by three numerals separated by periods.

The Clark Fork Recovery Unit chapter should be updated as recovery tasks are accomplished or revised as environmental conditions change and as monitoring results or additional information become available. The Clark Fork Recovery Unit Teams should meet annually to review annual monitoring reports and summaries and to make recommendations to the U.S. Fish and Wildlife Service.

UPPER CLARK FORK RECOVERY SUBUNIT

1 Protect, restore, and maintain suitable habitat conditions for bull trout.

1.1 Maintain or improve water quality in bull trout core areas or potential core habitat.

1.1.1 Reduce general sediment sources. Stabilize roads, crossings, and other sources of sediment delivery. Implement Watershed Improvement Needs activities throughout the Bitterroot River watershed and sediment source reduction activities identified by comprehensive U.S. Forest Service survey(s) elsewhere. Priority watersheds include **Bitterroot River:** Cameron, Camper, Fred Burr, Lolo (Highway 12), Martin, Meadow, Moose, Overwhich, Piquett, and Warm Springs Creeks and the Nez Perce Fork, East Fork, and mainstem Bitterroot Rivers; **Blackfoot River:** Arrastra, Belmont, Dick, Elk, Hogum, McElwain. Moose, Murray, Nevada, Poorman, Rock, Sauerkraut, Seven Up Pete, Warm Springs, and Wilson Creeks; **Clark Fork River:** Boulder, Cedar, Dry, Fish, Flint, Racetrack, Rattlesnake, Tamarack, and Warm Springs Creeks and the St. Regis and mainstem Clark Fork Rivers; **Little Blackfoot River:** Dog, Ontario, and Telegraph Creeks and numerous sites identified in survey; **Rock Creek:** Stony and Upper Willow Creeks and Middle Fork, Ross Fork, West Fork, and mainstem Rock Creek.

1.1.2 Upgrade problem roads. Increase maintenance of extensive secondary road systems of the U.S. Forest Service, Plum Creek Timber Company, and State lands by increasing application of best management practices, with emphasis on remediation of sediment-producing hotspots and maintenance of bridges, culverts, and crossings in drainages supporting bull trout spawning and rearing. Decommission surplus forest roads, especially those that are chronic sources of sediment and/or those located in areas of highly erodible geological formations. Remove culverts and/or bridges on closed roads that are no longer maintained. Paving or graveling portions of major roads that encroach on riparian zones to reduce sediment delivery may be appropriate, but such resurfacing must be considered on a case-by-case basis along with other factors, such as the impacts of easier accessibility for anglers. Priority watersheds include

Bitterroot River: Nez Perce Fork Road (improve), Meadow and Moose Creek roads in the East Fork, roads along the mainstem and Slate Creek in the West Fork Bitterroot River, and Skalkaho Highway; **Blackfoot River:** Poorman Creek (pave portions of Stemple Pass Road to reduce sediment delivery to the creek) and South Fork Poorman Creek (reroute a portion of the county road up the creek to the hillside to eliminate one culvert and three fords within a 0.4-kilometer [0.25-mile] stream reach); **Clark Fork River:** Fish Creek Road, State Highway 1 along Flint Creek, I-90 corridor, Upper Warm Springs Creek Road, Foster Creek, Storm Lake Road, and South Boulder Creek Road; **Rock Creek:** Skalkaho Highway (State Highway 38) along the West Fork, mainstem Rock Creek Road (needs management plan), Copper Creek, and Upper Willow Creek.

1.1.3 Clean up mine waste. Control mining runoff by removing or stabilizing mine tailings and waste rock deposited in the stream channel and floodplains and by restoring stream channel function. Priority watersheds include **Bitterroot River:** Hughes Creek in the West Fork Bitterroot, Stansbury Vermiculite Mine; **Blackfoot River:** Beartrap, Day Gulch, Douglas, Elk, Jefferson, Poorman, Sandbar (tributary to Willow), Sauerkraut, Seven Up Pete, Washington, Washoe, West Fork Ashby, and Willow Creeks and the mainstem Blackfoot River (downstream of the Mike Horse Dam that partially washed out in 1975); **Clark Fork River:** Dunkleberg (Forest Rose), Douglas (Wasa), Boulder (Nonpariel site), Cedar, Ninemile, Quartz, and Trout Creeks and the St. Regis River; **Little Blackfoot River:** Charter Oak, Golden Anchor, Ontario, and numerous other mine sites; **Rock Creek:** Frog Pond basin and sites in Middle Fork Rock Creek and Stony Creek drainages.

1.1.4 Implement Atlantic Richfield Corporation mitigation. Implement mitigation activities resulting from the Atlantic Richfield

Corporation settlement for heavy metals contamination of at least 562 kilometers (349 miles) of streams and 5,000 hectares (13,000 acres) of the Clark Fork River floodplain between Warm Springs Creek and Milltown Reservoir from past mining and ore-processing activities in the Butte and Anaconda areas. Impacts to surface water, streambed sediments, benthic macroinvertebrates, trout populations, riparian wildlife, and vegetation have been documented in the Clark Fork and Blackfoot River watersheds, and a mitigation plan is being developed through an advisory board process.

1.1.5 Monitor McDonald Gold Mine. Monitor the application status of the former McDonald Gold Mine near Lincoln and, if mine operations move forward, implement mitigation actions to reduce the potential negative effects on water quality and quantity.

1.1.6 Restore fish passage at Milltown Dam. Monitor and participate (representing bull trout concerns) in Superfund processes designed to decide the fate of Milltown Dam and the heavy metal deposits stored behind it. Fully restoring fish passage and eliminating the threat of toxic sediment discharge during runoff events are important elements for reducing fragmentation and supporting bull trout recovery.

1.1.7 Assess and mitigate nonpoint thermal pollution. Assess and attempt to mitigate effects on bull trout from thermal increases (nonpoint sources) that negatively impact receiving waters and migratory corridors downstream. Priority watersheds include **Bitterroot River:** Blodgett, Fred Burr, Kootenai, Roaring Lion, Lolo, Sawtooth, Skalkaho, Sleeping Child, and Tin Cup Creeks and the mainstem and East Forks of the Bitterroot River; **Blackfoot River:** Cottonwood (near Helmville), Douglas, Elk, Nevada, Nevada Spring, Union, and Willow (near Sauerkraut) Creeks and the Clearwater River; **Clark Fork River:** Fish, Flint,

Ninemile, Petty Creeks and the entire mainstem of the Clark Fork River; **Little Blackfoot River:** throughout the drainage; **Rock Creek:** Upper Willow Creek.

1.1.8 Reduce nutrient input. Reduce nutrient delivery throughout the Bitterroot and Clark Fork River watersheds by improving sewage disposal, agricultural practices, and silvicultural practices.

1.1.9 Implement water quality regulations. Enforce water quality standards and implement a total maximum daily load program.

1.1.10 Minimize recreational development in bull trout spawning and rearing habitat. Minimize impacts from expansion or development of new golf courses, ski areas, campgrounds, fishing access sites, and second home or other recreational developments in the corridors of bull trout spawning and rearing streams.

1.2 Identify barriers or sites of entrainment for bull trout and implement tasks to provide passage and eliminate entrainment.

1.2.1 Eliminate entrainment in diversions. Screen both water diversions and irrigation ditches to reduce entrainment losses or eliminate unneeded diversions. Priority watersheds include **Bitterroot River:** Bass, Blodgett, Burnt Fork, Chaffin, Fred Burr, Hughes, Kootenai, Lolo, Mill, Roaring Lion, Sawtooth, Skalkaho, Sleeping Child, Sweathouse, Tin Cup, and Tolan Creeks and the East Fork, Nez Perce Fork, and West Fork Bitterroot Rivers; **Blackfoot River:** Poorman Creek and mainstem Blackfoot River between Landers Fork and Poorman Creeks and between Lincoln and Nevada Creeks; **Clark Fork River:** Twin Lakes Creek in the Warm Springs Creek drainage, Flint Creek watershed, the mainstem Clark Fork River (five Missoula Valley diversions); **Little Blackfoot River:** Dog Creek and other creeks not yet evaluated; **Rock Creek:** East Fork Rock

Creek (Flint Creek Diversion), Ross Fork Rock Creek (diversions), and Upper Willow Creek (diverions).

1.2.2 Provide fish passage around diversions. Install appropriate fish passage structures around diversions and/or remove related migration barriers to facilitate bull trout movement. Priority watersheds include **Bitterroot River:** Burnt Fork, Fred Burr, Lolo, Skalkaho (Republican Ditch and others), Sleeping Child, and Warm Springs (Highway 93 crossing) Creeks; **Clark Fork River:** Dry and Lower Willow Creeks in Flint Creek drainage and Rattlesnake, Storm Lake, and Twin Lakes Creeks in Warm Springs Creek drainage; **Little Blackfoot River:** throughout drainage (survey is needed).

1.2.3 Eliminate culvert barriers. Monitor road crossings for blockages to upstream passage and, where beneficial to native fish, replace or improve existing culverts that impede passage. Priority watersheds include **Bitterroot River:** Bugle, Hughes, Lolo, Moose, Upper Mine, and Warm Springs Creeks and the upper West Fork and Nez Perce Fork of the Bitterroot River; **Blackfoot River:** Arrastra (Section 24), Cotter (tributary to Copper Creek), Cottonwood, Hogum, Moose, Poorman, Sauerkraut, and Spring Creeks; **Clark Fork River:** Fish Creek, Tamarack Creek, and St. Regis River; **Little Blackfoot River:** Hat Creek; **Rock Creek:** Skalkaho Highway crossings on West Fork Rock Creek (Duncie Creek, Fuse Creek, and others).

1.2.4 Restore connectivity over other manmade barriers. Investigate manmade barriers that were installed to eliminate upstream fish movement through Rainy, Alva, and Inez Lakes in the Clearwater River drainage, in Harvey Creek (Upper Clark Fork River), and in any other streams. Assess advisability and feasibility of restoring passage.

1.2.5 Improve instream flows. Restore connectivity and opportunities for migration by securing or improving instream flows and/or acquiring water rights. Priority streams identified to date (see also Montana Fish, Wildlife and Parks dewatered streams list) include **Bitterroot River:** Bass, Big, Blodgett, Chaffin, Fred Burr, Kootenai, Lolo, Lost Horse, Mill, North Bear, O'Brien, Roaring Lion, Rock, Sawtooth, Skalkaho, Sleeping Child, South Bear, South Fork Lolo, Sweathouse, Sweeney, Tin Cup, Tolan, and Warm Springs Creeks and the East Fork, Burnt Fork, and mainstem of the Bitterroot River from Corvallis to Stevensville; **Blackfoot River:** Cottonwood (stream miles 9 to 11) and Poorman Creeks and the mainstem Blackfoot River between Landers Fork and Poorman Creek; **Clark Fork River:** Cedar, Dry, Grant, Petty, and Twin Lakes Creeks and the Flint Creek drainage (including Douglas and Lower Willow Creeks); **Rock Creek:** Beaver Creek (tributary to Upper Willow).

1.2.6 Consider fish salvage, as needed. Consider implementing fish salvage programs, as needed, as an interim measure to address stranding while long-term solutions are developed (*e.g.,* Blackfoot River between Landers Fork and Poorman Creeks, East Fork Rock Creek at Flint Creek diversion).

1.2.7 Consider passage around natural barriers. Evaluate and make recommendations concerning potential benefits of fish passage around, or establishment of resident bull trout populations upstream of, natural barriers as a way to conserve genetic diversity in existing bull trout populations in the following areas: **Bitterroot River:** Bass, Daly, North Lost Horse, Overwhich, and Sweathouse Creeks upstream of falls; **Blackfoot River:** Arrastra Creek (section 24), Landers Fork (Silver King Falls), and North Fork Blackfoot River above North Fork Falls.

1.3 Identify impaired stream channel and riparian areas and implement tasks to restore their appropriate functions.

1.3.1 Conduct watershed problem assessments. Identify site-specific threats (problem assessment) that may be limiting bull trout in watersheds that have not already been evaluated, including the Bitterroot River, Little Blackfoot River, middle portions of the Clark Fork River, and Rock Creek drainages.

1.3.2 Prioritize actions on waters with restoration potential. As recovery progresses, identify highest-priority actions—ones that will contribute most to recovery—on streams in the Bitterroot River drainage where bull trout occurrence is incidental (or on contributing waters with no bull trout). Areas include Bass, Bear, Big, Cameron, Camp, Chaffin, Gird, Hayes, Lost Horse, Miller, One Horse, Patte, Rye, St. Clair, Sweeney, and Willow Creeks and the West Fork Bitterroot River downstream of Painted Rocks.

1.3.3 Revegetate denuded riparian areas. Revegetate to restore shade and canopy, riparian cover, and native vegetation. Priority watersheds include **Bitterroot River:** Blodgett, Fred Burr, Hughes, Meadow, Mill, Skalkaho, Sleeping Child, and Sweathouse Creeks and the East Fork, West Fork, Burnt Fork, and mainstem of the Bitterroot River; **Blackfoot River:** the mainstem Blackfoot River between the North Fork Blackfoot River and Arrastra Creek, Dunham Creek, Landers Fork, Nevada Creek, and other sites throughout the drainage; **Clark Fork:** Cedar, Dry, Fish, Ninemile, South Fork Lower Willow, **and** Petty Creeks and the St. Regis and mainstem Clark Fork Rivers; **Little Blackfoot River:** throughout the drainage; **Rock Creek:** the East Fork, Middle Fork, and Ross Fork of Rock Creek.

1.3.4 Improve grazing practices. Reduce negative effects of grazing by improving management practices and/or fencing riparian areas.

Priority watersheds include **Bitterroot River:** Bugle, Camp (west fork), Fred Burr, Gird, Lolo, Meadow, Mill, Skalkaho, Sleeping Child, and Tolan Creeks and the Burnt Fork, East Fork, and mainstem Bitterroot River; **Blackfoot River:** the mainstem Blackfoot River (from Lincoln to mouth) and Beaver, Blanchard, Belmont, Cottonwood, Dick, Douglas, Elk, Frazier, Hogum, Humbug, Keep Cool, Kleinschmidt, McElwain, Monture, Murray, Nevada, Nevada Spring, Poorman, Rock, Sauerkraut, Shanley, Warren, Wasson, Willow, and Yourname Creeks; **Clark Fork River:** Cedar, Petty, Racetrack, Tamarack, and Twin (St. Regis River drainage) Creeks and other sites (largely private lands) throughout the upper Clark Fork River drainage; **Little Blackfoot River:** Dog, Elliston, and Hat Creeks and the mainstem Little Blackfoot River; **Rock Creek:** the entire upper drainage, especially the upper mainstem Rock Creek, Middle Fork Rock Creek, Meadow Creek, Beaver Creek, Ross Fork, Sand Basin, Stoney Creek, and U.S. Forest Service allotments on Upper Willow Creek.

1.3.5 Restore stream channels. Conduct stream channel restoration activities where such activities are likely to benefit native fish and only where similar results cannot be achieved by other, less costly and less intrusive means. Priority watersheds include **Bitterroot River:** Blodgett, Burnt Fork, Fred Burr, Hughes, Lolo, Mill, O'Brien, Overwhich, Skalkaho, Sleeping Child, and Sweathouse Creeks and the East Fork (Highway 93 reconstruction) and Nez Perce Fork Bitterroot Rivers; **Blackfoot River:** Cottonwood, Dunham, Kleinschmidt, Landers Fork, Moose, Rock, Sauerkraut, and Warren Creeks; **Clark Fork River:** South Fork Lower Willow Creek in the Flint Creek drainage; **Rock Creek:** Stony Creek (Moose Gulch, Shively Gulch), Upper Willow Creek (Shylo Gulch, Miners Gulch), and the East Fork and West Fork of Rock Creek (Coal Gulch).

1.3.6 Improve instream habitat. Increase or improve instream habitat by restoring recruitment of large woody debris, restoring pool development, or by initiating other appropriate activities, wherever the need is identified. Priority watersheds include **Blackfoot River:** Chamberlain and Gold Creeks, the mainstem Blackfoot River upstream of Lincoln, and the Landers Fork; **Bitterroot River:** Burnt Fork, Lolo, and Moose Creeks and the East Fork Bitterroot River downstream of Camp Creek; **Clark Fork River:** Ninemile Creek; **Little Blackfoot River:** portions of the Little Blackfoot River that have been channelized by railroad and highway development.

1.3.7 Minimize potential stream channel degradation. Ensure that negative effects on bull trout of ongoing flood control activities are minimized (*e.g.*, dredging, channel clearing, and bank stabilization on the Clark Fork, Blackfoot, and Bitterroot Rivers).

1.3.8 Manage beaver to function naturally in maintaining wetlands. Manage beaver populations to maintain wetland complexes that provide important biological filters (*e.g.*, Mike Renig Gulch in the Little Blackfoot River drainage).

1.3.9 Reduce riparian firewood harvest. Implement campaigns, such as with signs, to improve public awareness or implement regulatory actions to eliminate firewood cutting in riparian areas, especially in the Rock Creek and Skalkaho Creek drainages.

1.3.10 Reduce impacts from campsite use. Identify and mitigate impacts from concentrated use of campsites on the Burnt Fork and Skalkaho Creeks in the Bitterroot River drainage; on the North Fork and mainstem Blackfoot Rivers and Monture, Copper, and Gold Creeks; on Middle Fork and mainstem Rock Creeks; and on Racetrack Creek in the upper Clark Fork River drainage.

1.3.11 Mitigate for transportation corridor encroachment on streams. Mitigate for impacts from the legacy effects of highway and railroad encroachment, channel straightening, channel relocation, and undersized bridges on the Bitterroot River (U.S. 93), Blackfoot River (Montana 200), Clark Fork River (I-90), Lolo Creek (U.S. 12), and St. Regis River (I-90).

1.3.12 Reduce impacts to Foster Creek. Identify and mitigate potential impacts (from sediment, water use, use of riparian areas) of the Anaconda Job Corps Center development on Foster Creek in the Warm Springs Creek drainage of the upper Clark Fork River drainage.

1.4 Operate dams to minimize negative effects on bull trout.

1.4.1 Reduce reservoir operational impacts. Review reservoir operational concerns (*e.g.*, water level manipulation, minimum pool elevation) and provide operating recommendations for East Fork Reservoir (East Fork Rock Creek), Georgetown Lake (Flint Creek), Nevada Reservoir (Nevada Creek in Blackfoot River drainage), and Painted Rocks Reservoir (West Fork Bitterroot River).

1.4.2 Provide instream flow downstream of dams. Maintain or exceed established instream flows downstream of Painted Rocks Reservoir (West Fork Bitterroot River), East Fork Reservoir (East Fork Rock Creek), and Georgetown Lake (Flint Creek). Establish instream flows from high-elevation reservoirs in the Bitterroot National Forest on Bass, Big, Blodgett, Burnt Fork, Fred Burr, and Tin Cup Creeks.

1.4.3 Operate Milltown Dam to minimize impact on native fish. If the dam is not removed, operate to minimize potential for downstream discharge of heavy metal deposits in Milltown

Reservoir. Operate the dam to minimize northern pike reproduction and maximize survival and downstream passage of bull trout juveniles and adults. Restore upstream fish passage.

1.4.4 Evaluate fish passage at Painted Rocks Dam. Evaluate advisability and need for upstream fish passage at Painted Rocks Dam (West Fork Bitterroot River).

1.5 Identify upland conditions that negatively affect bull trout habitats and implement tasks to restore appropriate functions.

1.5.1 Mitigate for legacy effects of mining-related timber management practices. Continue to mitigate for legacy effects of mining-related timber harvest and for other impairment from poor silvicultural practices in the last century in the following areas: **Blackfoot River:** Bear, Belmont, Chamberlain, Deer, Keno, Marcum, McElwain, and Richmond Creeks and the North Fork Blackfoot and West Fork Clearwater Rivers; **Clark Fork River:** Fish, Rattlesnake, and Trout Creeks and the St. Regis River.

1.5.2 Monitor fire effects and mitigate effects where necessary. Monitor effects from wild fires and pursue habitat restoration actions where warranted, especially in the upper portions of the Bitterroot River drainage (where there were fires in 2000).

2 Prevent and reduce negative effects of nonnative fishes and other nonnative taxa on bull trout.

2.1 Develop, implement, and evaluate enforcement of public and private fish stocking policies to reduce stocking of nonnative fishes that affect bull trout.

2.1.1 Review fish stocking programs. Review annual fish stocking programs to minimize potential conflict with this bull trout recovery plan.

2.1.2 Regulate private fish ponds. Reduce the risk of inadvertent introduction of nonnative fish from private fish ponds by closely regulating existing permits to ensure that only permitted species are stocked and that fish barriers are maintained and by attaching conditions to future permits.

2.1.3 Encourage development of commercial sources of westslope cutthroat trout. Develop and maintain an approved and available source of genetically diverse native westslope cutthroat trout for private pond stocking. Follow stocking guidelines developed by the Montana Westslope Cutthroat Trout Technical Committee.

2.2 Evaluate policies for preventing illegal transport and introduction of nonnative fishes.

2.3 Inform the public about ecosystem concerns of illegal introductions of nonnative fishes.

2.3.1 Discourage unauthorized fish introductions. Implement educational efforts about the problems and consequences of unauthorized fish introductions.

2.3.2 Develop bull trout education program. Develop a public information program with a broad emphasis on bull trout ecology and life history requirements and with a more specific focus on regionally or locally important recovery issues.

2.4 Evaluate biological, economic, and social effects of control of nonnative fishes.

2.5 Implement control of nonnative fishes where found to be feasible and appropriate.

2.5.1 Experimentally remove established brook trout populations. Evaluate opportunities for experimentally removing brook trout from selected streams and lakes. Priority watersheds include **Bitterroot River:** Blodgett, Boulder, Fred Burr, Hughes, Kootenai, Lolo, Martin, Meadow, Mill, O'Brien, Overwhich, Piquett, Roaring Lion, Sawtooth, Skalkaho, Slate, Sleeping Child, Springer, Tin Cup, Trapper, and Warm Springs Creeks and the East Fork, Burnt Fork, and Nez Perce Fork Bitterroot Rivers; **Blackfoot River:** Cottonwood, Hogum, Nevada (upstream of Shingle Mill), Poorman, Sauerkraut, and South Fork Poorman Creeks and the North Fork Blackfoot River upstream of the falls; **Clark Fork River:** Lower Twin Lake and Storm Lake Creek in the Warm Springs Creek drainage; **Little Blackfoot River:** Bison, Hat, Elliston, and Ontario Creeks; **Rock Creek:** East Fork Reservoir and upstream waters.

2.5.2 Suppress northern pike in Clearwater Lakes chain. Continue assessment of predator–prey interactions in Clearwater Chain of Lakes, with emphasis on the northern pike threat and suppression of those populations.

2.5.3 Reduce brown trout numbers in portions of mainstem rivers. Continue to encourage harvest of brown trout in the mainstem Blackfoot, Clark Fork, and Bitterroot Rivers and in Rock Creek by maintaining liberal angling regulations.

2.6 Develop tasks to reduce negative effects of nonnative taxa on bull trout.

2.6.1 Evaluate bull trout–brown trout interaction. Evaluate the interaction between bull trout and brown trout populations in the

Blackfoot River drainage, including the potential threat of brown trout redds superimposed on bull trout redds.

3 Establish fisheries management goals and objectives compatible with bull trout recovery and implement practices to achieve goals.

3.1 Develop and implement State and Tribal native fish management plans integrating adaptive research.

3.1.1 Implement adaptive management of native fish management plans. Develop and implement native fish management plans that emphasize integration of research results into management programs.

3.1.2 Aggressively protect remaining native species complexes. Protect integrity of all intact native species assemblages, such as in Harvey Creek (upper Clark Fork River), Belmont and Copper Creeks, and the Landers Fork of the Blackfoot River, by aggressively removing any nonnative invaders.

3.2 Evaluate and prevent overharvest and incidental angling mortality of bull trout.

3.2.1 Minimize unintentional mortality of bull trout. Continue to develop and implement sport angling regulations and fisheries management plans, guidelines, and policies that minimize incidental mortality of bull trout in all waters, especially the most heavily fished reaches of Rock Creek and the Bitterroot, Blackfoot, upper Clark Fork, and Clearwater Rivers.

3.2.2 Evaluate enforcement of angling regulations and oversee scientific research. Ensure compliance with angling regulations and scientific collection policies and target bull trout spawning and staging areas for enforcement.

3.2.3 Implement angler education efforts. Inform anglers about special regulations and about how to identify bull trout and reduce hooking mortality of bull trout caught incidentally, especially in the most heavily fished migratory habitat of mainstem rivers.

3.2.4 Solicit information from commercial guides. Develop a reporting system to collect information on bull trout caught and released by commercial fishing guides on the Bitterroot River, Blackfoot River, and Rock Creek.

3.3 Evaluate potential effects of introduced fishes and associated sport fisheries on bull trout recovery and implement tasks to minimize negative effects on bull trout.

3.3.1 Evaluate site-specific conflicts with introduced sport fish. Determine site-specific level of predation, competition, and hybridization of bull trout with introduced sport fish and assess effects of those interactions, especially with brook trout, brown trout, and northern pike in the Blackfoot, Bitterroot, and Clark Fork Rivers.

3.4 Evaluate effects of existing and proposed sport fishing regulations on bull trout.

3.4.1 Evaluate effects of existing and proposed angling regulations on bull trout in heavily fished waters. Rapidly increasing angler pressure has led to increasing concerns about angling regulations, species complexes, unintentional mortality, and other angler-related issues affecting bull trout on the most heavily fished waters of Rock Creek and the Blackfoot, Bitterroot, and Clark Fork Rivers. An investigation of these issues should be made, and recommendations on how to reduce impacts to bull trout recovery should be developed and adaptively implemented.

4 Characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout.

4.1 Incorporate conservation of genetic and phenotypic attributes of bull trout into recovery and management plans.

4.1.1 Conduct genetic inventory. Continue coordinated genetic inventory throughout recovery subunit, with emphasis on upper Clark Fork and Clearwater River drainages, to contribute to establishing a program to understand the genetic baseline and to monitor genetic changes throughout the range of bull trout (see Chapter 1 narrative).

4.2 Maintain existing opportunities for gene flow among bull trout populations.

4. 3 Develop genetic management plans and guidelines for appropriate use of transplantation and artificial propagation.

5 Conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks.

5.1 Design and implement a standardized monitoring program to assess the effectiveness of recovery efforts affecting bull trout and their habitats.

5.2 Conduct research evaluating relationships among bull trout distribution and abundance, bull trout habitat, and recovery tasks.

5.2.1 Identify suitable unoccupied habitat. Identify suitable bull trout habitat that is unoccupied, if any. Within five years, complete a comprehensive list of all known passage barriers that prevent upstream-migrating bull trout from accessing suitable habitat.

5.2.2 Investigate bull trout movement and distribution. Investigate movement, distribution, and status of bull trout in the Bitterroot, middle Clark Fork, Clearwater, Little Blackfoot, and St. Regis River drainages and make recovery recommendations.

5.2.3 Evaluate importance of contributing waters. Evaluate the importance and contribution to bull trout recovery of streams with only incidental bull trout presence.

5.2.4 Map spawning habitat. Develop a comprehensive map of primary bull trout spawning reaches in tributaries for the purpose of focusing protection and recovery efforts.

5.2.5 Coordinate monitoring of fish movement. Develop a coordinated fish marking and tracking strategy (*e.g.*, standardized PIT tags and radio implant frequencies) throughout the Clark Fork River basin so that marked fish are recognized and reported when captured in other States or different project jurisdictions (*e.g.*, Lake Pend Oreille, Avista, Milltown).

5.2.6 Evaluate water temperature as a limiting factor. Evaluate water temperature as a limiting factor and/or migration barrier in the mainstem of the Bitterroot, Blackfoot, Clearwater, and Clark Fork Rivers.

5.3 Evaluate the adequacy and effectiveness of current and past best management practices in maintaining or achieving habitat conditions conducive to bull trout recovery.

5.3.1 Develop and implement best management practices for managing water diversions. Establish best management practices for constructing, maintaining, and operating water diversion structures.

5.3.2 Implement best management practices for grazing in riparian zones. Establish best management practices for grazing management and establish a monitoring program in riparian zones.

5.3.3 Expand monitoring of forestry best management practices. Continue and expand monitoring of compliance and effectiveness of Montana Forestry best management practices and recommend adjustments to best management practices to correct any documented deficiencies.

5.3.4 Protect groundwater inflow sources. Inventory and protect important stream reaches with groundwater inflow.

5.4 Evaluate effects of diseases and parasites on bull trout and develop and implement strategies to minimize negative effects.

5.4.1 Monitor fish health in private hatcheries. Closely regulate fish health in private hatcheries that supply fish for private ponds (State and Federal hatcheries are already closely monitored).

5.4.2 Prevent spread of fish pathogens. Survey and evaluate fish health before implementing major fish passage projects.

5.4.3 Evaluate effects of whirling disease on bull trout. Continue experimental evaluation (and limited field survey) of the potential effects of whirling disease on bull trout.

5.5 Develop and conduct research and monitoring studies to improve information concerning the distribution and status of bull trout.

5.6 Identify evaluations needed to improve understanding of relationships among genetic characteristics, phenotypic traits, and local populations of bull trout.

5.6.1 Investigate status of migratory and resident life history forms. Investigate the genetic and/or behavioral basis of resident and migratory bull trout in the Bitterroot River basin.

5.6.2 Research origin of migratory bull trout at Milltown Dam. Continue to investigate life history and spawning habitat of bull trout congregating below Milltown Dam.

6 Use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats.

6.1 Use partnerships and collaborative processes to protect, maintain, and restore functioning core areas for bull trout.

6.1.1 Support watershed group restoration efforts. Support collaborative efforts by local watershed groups already established in Montana, such as the Bitterroot Water Forum, Blackfoot Challenge, Trout Unlimited Chapters, and Clark Fork Coalition, to accomplish site-specific protection and restoration activities consistent with this recovery plan.

6.1.2 Protect habitat. Provide long-term habitat protection through purchase, conservation easements, watershed restoration, management plans, land exchanges, and other methods. Opportunities have been identified on the Blackfoot River and the Little Blackfoot River upstream of Hwy. 12 crossing; Hughes Creek in the West Fork Bitterroot River drainage; and Fish Creek, the mainstem Clark Fork River, and Rock Creek.

6.1.3 Integrate watershed restoration efforts on public and private lands. Integrate watershed analyses and restoration activities on public lands in the headwaters and on private lands lower in the watersheds to ensure activities are complementary for bull trout

restoration (*e.g.*, Bitterroot River, Dunham Creek, Fish Creek, Landers Fork of the Blackfoot River, Rattlesnake Creek, Rock Creek, and Warm Springs Creek).

6.1.4 Develop strategy for implementation participation. Develop participation plans to support implementation or recovery actions in the Upper Clark Fork Recovery Subunit.

6.2 Use existing Federal authorities to conserve and restore bull trout.

6.2.3 Complete Federal Energy Regulatory Commission licensing of Milltown Dam. Complete Federal Energy Regulatory Commission licensing or decommissioning of Milltown Dam (beyond current license expiration date of December 31, 2006) and implement mitigation plan and/or dam removal.

6.2.4 Implement Plum Creek Habitat Conservation Plan. Carry out compliance monitoring and U.S. Fish and Wildlife Service commitment to adaptive management planning under the Plum Creek Native Fish Habitat Conservation Plan, primarily applicable to waters of the Blackfoot River and upper Clark Fork River watersheds.

6.3 Evaluate enforcement of existing Federal and State habitat protection standards and regulations and evaluate their effectiveness for bull trout conservation.

6.3.1 Fully implement State habitat protection laws. Fully implement the Montana Streamside Management Zone Law (1993), Montana Stream Protection Act (1965), and Montana Natural Streambed and Land Preservation Act (1975) to maximize legal protection of bull trout habitat under State law and evaluate the effectiveness of these laws in conserving bull trout habitat.

6.3.2 Encourage floodplain protection. Encourage local governments to develop, implement, and promote restrictive regulations for floodplains to mitigate extensive habitat loss and stream encroachment from rural residential development throughout the Bitterroot, Blackfoot, and upper Clark Fork River drainages because these and other effects of development exacerbate temperature problems, increase nutrient loads, decrease bank stability, alter instream and riparian habitat, and change hydrologic response of affected watersheds.

7 Assess the implementation of bull trout recovery by recovery units and revise recovery unit plans based on evaluations.

LOWER CLARK FORK RECOVERY SUBUNIT

1 Protect, restore, and maintain suitable habitat conditions for bull trout.

1.1 Maintain or improve water quality in bull trout core areas or potential core habitat.

1.1.1 Reduce general sediment sources. Stabilize roads, crossings, and other sources of sediment delivery. Priority watersheds include **Idaho:** Gold, Granite, Grouse, Lightning, North Gold, and Trestle Creeks and the Middle Fork East River and Pack River; **Montana:** Elk, Fish Trap (Thompson River tributary), Marten, Pilgrim, Prospect, Rock, Snake Swamp, West Fork Elk (Bull River tributary) Creeks and the Bull, South Fork Bull, South Fork Jocko, Thompson, Vermilion, and West Fork Thompson Rivers.

1.1.2 Upgrade problem roads. Increase maintenance of extensive secondary road systems—U.S. Forest Service, Plum Creek Timber Company, and State lands—by increased application of best management practices, with emphasis on remediating sediment-producing hotspots and on maintaining bridges,

culverts, and crossings in drainages that support bull trout spawning and rearing. Decommission surplus forest roads, especially those that are chronic sources of sediment and those that are located in areas of highly erodible geological formations. Remove culverts and bridges on closed roads that are no longer maintained. Eliminate one of two main roads paralleling either side of Thompson River to reduce impacts of sediment and floodplain encroachment.

1.1.3 Clean up mine waste. Control mining runoff by removing or stabilizing mine tailings and waste rock formerly deposited in the stream channel and floodplain of upper South Gold Creek and Chloride Gulch.

1.1.4 Evaluate and, if necessary, mitigate impacts from Rock Creek Mine. Develop and implement an aggressive mitigation program to protect bull trout in the Rock Creek watershed if the Rock Creek Mine (Sterling Mining Company) is developed.

1.1.5 Implement Atlantic Richfield Corporation mitigation on Flathead Indian Reservation. Implement Confederated Salish and Kootenai Tribes/Atlantic Richfield Corporation settlement to improve water quality in Flathead Reservation streams.

1.1.6 Assess and mitigate nonpoint thermal pollution. Continue to evaluate adequacy of existing thermal regime in the lower Flathead River, Thompson River, and mainstem Clark Fork River reservoirs in meeting needs of migratory bull trout and explore options to correct conditions.

1.1.7 Reduce nutrient input. Assess and, if needed, address effects of nutrient enrichment from Missoula Municipal Sewage Plant, Stone Container Mill, and shoreline development at Lake Pend Oreille .

1.1.8 Implement water quality regulations. Evaluate enforcement of water quality standards and implement total maximum daily load program.

1.1.9 Minimize recreational development in bull trout spawning and rearing habitat. Minimize impacts from expansion or development of new golf courses, ski areas, campgrounds, fishing access sites, and second home or other recreational developments in the corridors of bull trout spawning and rearing streams.

1.2 Identify barriers or sites of entrainment for bull trout and implement tasks to provide passage and eliminate entrainment.

1.2.1 Eliminate entrainment in diversions. Screen both water diversions and irrigation ditches or eliminate unneeded diversions (evaluate Grouse Creek, Swamp Creek, and others, as identified by watershed groups).

1.2.2 Provide fish passage around diversions. Install appropriate fish passage structures around diversions and/or remove related migration barriers in **Idaho:** Granite Creek, Strong Creek; **Montana:** Crow Creek, Dry Creek, Jocko River, Mission Creek, Post Creek, Swamp Creek, and others, as identified.

1.2.3 Eliminate culvert barriers. Monitor road crossings for blockages to upstream passage, and, where beneficial to native fish, replace or improve existing culverts that impede passage (*e.g.,* Blue Creek, Middle Fork East River, and North Fork East River).

1.2.4 Mitigate Trestle Creek flume impacts. Investigate effects of the Trestle Creek flume and develop a plan to minimize and mitigate negative effects of the flume and unused water rights.

1.2.5 Improve instream flows. Restore connectivity and opportunities for migration by securing or improving instream flows. This task can be accomplished in part by acquiring water rights from willing sellers in Montana (priority streams identified to date are Rock and Swamp Creeks) or by designating minimum flows through the statutory process in Idaho (*e.g.*, Trestle Creek).

1.2.6 Consider fish salvage, as needed. Consider implementing fish salvage programs, as needed, as an interim measure to address stranding while long-term solutions are developed (*e.g.*, Rock Creek).

1.3 Identify impaired stream channel and riparian areas and implement tasks to restore their appropriate functions.

1.3.1 Conduct watershed problem assessments. Identify site-specific threats (problem assessment) that may be limiting bull trout in watersheds that have not already been evaluated (*e.g.*, East River)

1.3.2 Revegetate denuded riparian areas. Revegetate to restore shade and canopy, riparian cover, and native vegetation. Priority watersheds include **Idaho:** Pack River and Twin Creek; **Montana:** meadow portion of mainstem Bull River, Jocko River, Prospect Creek, Rock Creek, and Vermilion River.

1.3.3 Improve grazing practices. Reduce negative effects of grazing with improved grazing management or riparian fencing. Priority watersheds include **Idaho:** Grouse Creek, Lightning Creek, Twin Creek; **Montana:** Jocko River, Pilgrim Creek, Post Creek, Swamp Creek, and Thompson River (upper mainstem and tributaries), Little Thompson River, and Fish Trap Creek.

1.3.4 Restore stream channels. Conduct stream channel restoration activities where they are likely to benefit native fish and only

where similar results cannot be achieved by other, less costly and less intrusive means. Priority watersheds include **Idaho:** Grouse, Lightning, and lower Twin Creeks and the Pack River; **Montana:** Barrey and Copper (both Bull River tributaries), Fish Trap (Thompson River tributary), Graves, Marten, Prospect, and Rock Creeks and the Jocko, Vermilion, and West Fork Thompson Rivers.

1.3.5 Improve instream habitat. Increase or improve instream habitat by restoring recruitment of large woody debris, restoring pool development, or by initiating other appropriate activities (*e.g.*, deforested power line crossing on South Gold Creek, East River).

1.3.6 Minimize potential stream channel degradation. Ensure that negative effects to bull trout of ongoing flood control activities (*e.g.*, dredging, channel clearing on Lightning Creek) are minimized.

1.3.7 Manage beaver to function naturally in maintaining wetlands. Manage beaver populations to maintain wetland complexes that provide important biological filters, while also closely examining beaver dams on a case-by-case basis to take action to minimize disruption of bull trout migration through migratory corridors because of beaver dams.

1.4 Operate dams to minimize negative effects on bull trout.

1.4.1 Evaluate and restore upstream fish passage at mainstem Clark Fork and Pend Oreille River dams. Investigate and implement upstream fish passage at Albeni Falls (USFWS Biological Opinion), Cabinet Gorge and Noxon Rapids (Avista fish passage protection, mitigation, and enhancement measures), and Thompson Falls Dams, as needed, to reconnect fragmented core habitat of bull trout with Lake Pend Oreille.

1.4.2 Provide safe passage downstream through dams and reservoirs. Provide safe downstream fish passage from Montana tributaries through Thompson Falls, Noxon Rapids, and Cabinet Gorge Dams and Reservoirs for juvenile and adult bull trout migrating to Lake Pend Oreille.

1.4.3 Reduce reservoir operational impacts. Review reservoir operational concerns (*e.g.*, water level manipulation) and provide operating recommendations through the Federal Energy Regulatory Commission license and/or Federal consultation for Lake Pend Oreille (USFWS Biological Opinion), Cabinet Gorge, Noxon Rapids, and Thompson Falls Reservoirs.

1.4.4 Research and recommend instream flows and minimum pools on the Flathead Agency Irrigation District. Conduct research on operations of Flathead Agency Irrigation District reservoirs and recommend simulated natural flow regimes and implement minimum pool levels in St. Marys, Mission, and McDonald Reservoirs.

1.4.5 Provide instream flow downstream of dams. Maintain or exceed established minimum flow releases of 1,500 cubic meters per second (5,000 cubic feet per second) downstream of Cabinet Gorge Dam and 975 cubic meters per second (3,200 cubic feet per second) downstream of Kerr Dam, as provided for in the respective Federal Energy Regulatory Commission licenses. Evaluate instream flow for adequacy and recommend revision, as needed.

1.4.6 Research and recommend instream flow in lower Flathead River. Complete instream flow research on lower Flathead River (Kerr Dam Mitigation) and implement ramping rate and minimum flow recommendations.

1.4.7 Maintain passage through alluvial fans in Lake Pend Oreille. Maintain physical passage through alluvial fans (resulting from reservoir fluctuation from operations of Albeni Falls Dam) on streams that enter Lake Pend Oreille (*e.g.*, North Gold and South Gold Creeks).

1.4.8 Assess impact of Lake Pend Oreille water levels on kokanee salmon. Continue research on the response of the kokanee salmon population in Lake Pend Oreille to modified winter lake levels per the U.S. Fish and Wildlife Service Biological Opinion (USFWS 2000) as kokanee salmon are an important food source for bull trout and may help to reduce competition between bull trout and other top predators.

1.4.9 Avoid gas supersaturation. Reduce gas entrainment, which causes supersaturation conditions believed to be detrimental to bull trout, at Noxon Rapids and Cabinet Gorge Dams and evaluate potential problems of gas supersaturation at Kerr and Thompson Falls Dams.

1.5 Identify upland conditions that negatively affect bull trout habitats and implement tasks to restore appropriate functions.

1.5.1 Monitor fire effects and mitigate effects where necessary. Monitor effects from wild fires and pursue habitat restoration actions where warranted.

2 Prevent and reduce negative effects of nonnative fishes and other nonnative taxa on bull trout.

2.1 Develop, implement, and evaluate enforcement of policies on public and private fish stocking to reduce stocking of nonnative fishes that affect bull trout.

2.1.1 Review fish stocking programs. Review annual fish stocking programs to minimize potential conflict with this bull trout recovery plan.

2.1.2 Regulate private fish ponds. Reduce the risks of inadvertent introduction of nonnative fish from private fish ponds by closely regulating existing permits to ensure that only permitted species are stocked and that fish barriers are maintained and by attaching conditions to future permits.

2.1.3 Encourage development of commercial sources of westslope cutthroat trout. Develop and maintain an approved and available source of genetically diverse native westslope cutthroat trout for private pond stocking. Follow stocking guidelines developed by the Montana Westslope Cutthroat Trout Technical Committee.

2.2 Evaluate policies for preventing illegal transport and introduction of nonnative fishes.

2.2.1 Optimize enforcement of laws and policies that prohibit unauthorized fish transplant and stocking. Strengthen enforcement of existing laws and continue to work to improve the legal and policy framework for preventing unauthorized fish transplant and stocking.

2.3 Inform the public about ecosystem concerns of illegal introductions of nonnative fishes.

2.3.1 Discourage unauthorized fish introductions. Implement educational efforts about the problems and consequences of unauthorized fish introductions.

2.3.2 Develop bull trout education program. Develop a public information program with a broad emphasis on bull trout ecology

and life history requirements and a more specific focus on regionally or locally important recovery issues.

2.4 Evaluate biological, economic, and social effects of control of nonnative fishes.

2.4.1 Assess superimposition of brown trout and kokanee salmon redds on bull trout redds. Assess the threat of kokanee salmon redds superimposed on bull trout redds in Granite Creek (including Sullivan Springs) and of brown trout redds superimposed on bull trout redds in the Bull River, Twin Creek, and other sites, as identified.

2.4.2 Evaluate northern pike and smallmouth bass in the lower Flathead River. Evaluate, and if necessary control expansion of northern pike and recent accidental introduction of smallmouth bass in the lower Flathead River and waters downstream.

2.5 Implement control of nonnative fishes where found to be feasible and appropriate.

2.5.1 Experimentally remove established brook trout populations. Evaluate opportunities to experimentally remove brook trout from selected streams and lakes. Priority watersheds include **Idaho:** East Fork Lightning Creek, North Fork Grouse Creek, Porcupine Creek, Porcupine Lake, and Twin Creek; **Montana:** Clear Creek (Prospect Creek tributary); Copper, Elk, and Graves Creeks (upstream of falls); Marten, Mosquito, and Pilgrim Creeks; and the South Fork Bull River.

2.5.2 Suppress lake trout in Lake Pend Oreille. Continue assessment of predator–prey interactions in mainstem reservoirs and Lake Pend Oreille. In Lake Pend Oreille, evaluate the threat of lake trout and

analyze options for using commercial-type fishing gear to reduce lake trout numbers.

2.5.3 Suppress brown trout in Bull River. Evaluate and experimentally remove brown trout from Bull River and other drainages, as necessary. Block access for spawning brown trout to the East Fork Bull River. Conduct evaluation of potential response of native species.

2.6 Develop tasks to reduce negative effects of nonnative taxa on bull trout.

3 Establish fisheries management goals and objectives compatible with bull trout recovery and implement practices to achieve goals.

3.1 Develop and implement State and Tribal native fish management plans integrating adaptive research.

3.1.1 Implement adaptive management of native fish management plans. Adaptively integrate research results into management programs and native fish management plans.

3.1.2 Implement Avista Native Salmonid Restoration Plan. Develop and implement an aggressive management strategy for bull trout for the Bull River and other watersheds in the regulated portion of the mainstem Clark Fork River drainage consistent with the Avista Native Salmonid Restoration Plan and Montana Fish, Wildlife and Parks policies. According to the Avista Native Salmon Restoration Plan, and consistent with genetic guidelines, management strategy may include stock transfer, controlled propagation, and/or rearing of bull trout for the purposes of genetic attribute maintenance, refugia, reintroduction, or otherwise supporting recovery.

3.2 Evaluate and prevent overharvest and incidental angling mortality of bull trout.

3.2.1 Minimize unintentional mortality of bull trout. Continue to develop and implement sport angling regulations and fisheries management plans, guidelines, and policies that minimize unintentional mortality of bull trout in Lake Pend Oreille, the Clark Fork River, and the mainstem reservoirs.

3.2.2 Evaluate enforcement of angling regulations and oversee scientific research. Ensure compliance with angling regulations and scientific collection policies and target bull trout spawning and staging areas for enforcement.

3.2.3 Implement angler education efforts. Inform anglers about special regulations and about how to identify bull trout and reduce hooking mortality of bull trout caught incidentally in Lake Pend Oreille, the Clark Fork River, and the mainstem reservoirs.

3.2.4 Solicit information from commercial guides. Develop a reporting system to collect information on bull trout that are caught and released from charter boats and by commercial fishing guides on Lake Pend Oreille and the Clark Fork River.

3.3 Evaluate potential effects of introduced fishes and associated sport fisheries on bull trout recovery and implement tasks to minimize negative effects on bull trout.

3.3.1 Evaluate site-specific conflicts with introduced sport fish. Determine site-specific level of predation, competition, and hybridization of bull trout with introduced sport fish and assess the effects of those interactions, especially for lake trout, Kamloops rainbow trout, and brook trout in Lake Pend Oreille and tributaries and for brown trout, rainbow trout, brook trout,

northern pike, largemouth and smallmouth bass, and possibly walleye in the watershed upstream of Cabinet Gorge Dam.

3.3.2 Regulate mainstem reservoirs to inhibit reproduction of nonnative fish. Evaluate options to regulate water levels on Thompson Falls, Noxon Rapids, and Cabinet Gorge Reservoirs and Lake Pend Oreille in a pattern to reduce survival of nonnative species that are detrimental to bull trout recovery.

3.4 Evaluate effects of existing and proposed sport fishing regulations on bull trout.

3.4.1 Evaluate opportunities for regulated bull trout fisheries. Evaluate management proposals to allow carefully regulated fisheries for, and potential harvest of, bull trout (in Lake Pend Oreille or other waters) where monitoring of the population status provides a clear record that a harvestable surplus can be maintained and that such harvest will benefit, or at least not be detrimental to, recovery goals.

4 Characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout.

4.1 Incorporate conservation of genetic and phenotypic attributes of bull trout into recovery and management plans.

4.1.1 Conduct genetic inventory. Continue coordinated genetic inventory throughout recovery subunit and analysis of origin of bull trout captured downstream of Cabinet Gorge Dam.

4.2 Maintain existing opportunities for gene flow among bull trout populations.

4.3 Develop genetic management plans and guidelines for appropriate use of transplantation and artificial propagation.

5 Conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks.

5.1 Design and implement a standardized monitoring program to assess the effectiveness of recovery efforts affecting bull trout and their habitats.

5.2 Conduct research to evaluate relationships among bull trout distribution and abundance, bull trout habitat, and recovery tasks.

5.2.1 Identify suitable unoccupied habitat. Identify suitable unoccupied habitat, if any. Within five years, complete a comprehensive list of all known passage barriers that prevent upstream-migrating bull trout from accessing suitable habitat.

5.2.2 Evaluate habitat suitability (*i.e.*, thermal conditions) in reservoirs. Continue to evaluate suitability of mainstem reservoir habitat for bull trout and investigate potential methods for temperature manipulation.

5.2.3 Investigate bull trout movement and distribution. Determine movement and seasonal use of different habitat types by adult and subadult migratory bull trout with emphasis on Lake Pend Oreille and the mainstem Clark Fork River and reservoirs.

5.2.4 Coordinate monitoring of fish movement. Develop a coordinated fish marking and tracking strategy *(e.g.*, standardized PIT tags and radio implant frequencies) throughout the Clark Fork River basin so that marked fish are recognized and reported when

captured in other States or different project jurisdictions (*e.g.*, Lake Pend Oreille, Avista, Milltown).

5.2.5 Research origin of bull trout that migrate to Cabinet Gorge Dam. Investigate life history of bull trout spawning in the mainstem Clark Fork River below Cabinet Gorge Dam.

5.2.6 Evaluate feasibility of maintaining fluvial/resident populations. If restoration of adfluvial bull trout runs from Lake Pend Oreille upstream of Cabinet Gorge Dam does not succeed, refocus strategy toward establishing multiple fluvial and resident populations, consistent with the Native Salmonid Restoration Plan.

5.2.7 Map spawning habitat. Develop a comprehensive map of primary tributary reaches of bull trout spawning for focusing protection and recovery efforts.

5.3 Conduct evaluations of the adequacy and effectiveness of current and past best management practices in maintaining or achieving habitat conditions conducive to bull trout recovery.

5.3.1 Evaluate efficacy of trap/transport project. Conduct an assessment to determine whether transported juvenile fish survive better than those migrating volitionally through the lower Clark Fork River dams.

5.4 Evaluate effects of diseases and parasites on bull trout and develop and implement strategies to minimize negative effects.

5.4.1 Monitor fish health in private hatcheries. Closely regulate fish health in private hatcheries that supply fish for private ponds (State and Federal hatcheries are already closely monitored).

5.4.2 Prevent spread of fish pathogens. Survey and evaluate fish health before implementing major fish passage projects.

5.5 Develop and conduct research and monitoring studies to improve information concerning the distribution and status of bull trout.

5.5.1 Evaluate Middle Fork East River. Assess bull trout population status in the Middle Fork East River and determine whether this local population has a migratory component. If that component is present, assess the extent of the foraging, migrating, and overwintering habitat and whether the population's origin is derived from Priest Lake or Lake Pend Oreille.

5.6 Identify evaluations needed to improve understanding of relationships among genetic characteristics, phenotypic traits, and local populations of bull trout.

6 Use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats.

6.1 Use partnerships and collaborative processes to protect, maintain, and restore functioning core areas for bull trout.

6.1.1 Support watershed group restoration efforts. Support collaborative efforts by local watershed groups that are already established in Montana and Idaho to accomplish site-specific protection/restoration activities consistent with this Recovery Plan.

6.1.2 Protect habitat. Provide long-term habitat protection through purchase, conservation easements, watershed restoration, management plans, and other methods**.** Emphasize in **Idaho:** Gold, Granite, Grouse, Johnson, Lightning, North Gold, Trestle,

and Twin Creeks and the Pack River watershed; in **Montana:** Bull River, Prospect Creek, and Jocko River watersheds.

6.2 Use existing Federal authorities to conserve and restore bull trout.

6.2.1 Monitor compliance with Avista Federal Energy Regulatory Commission Settlement Agreement. Monitor compliance with Avista Settlement Agreement (Federal Energy Regulatory Commission license) for operations of Cabinet Gorge and Noxon Rapids Dams.

6.2.2 Evaluate existing Federal Energy Regulatory Commission license conditions at Thompson Falls Dam. Evaluate compliance with Federal Energy Regulatory Commission Order and the potential need to reopen license for purposes of fish passage at Thompson Falls Dam.

6.2.3 Implement Federal Energy Regulatory Commission license conditions for Kerr Dam. Monitor compliance with Kerr Dam Federal Energy Regulatory Commission license conditions and operations in the Flathead River downstream of Kerr Dam.

6.2.4 Federal Columbia River Power System Biological Opinion. Monitor compliance with U.S. Fish and Wildlife Service Biological Opinion (USFWS 2000) (Federal Columbia River Power System) related to operation of Albeni Falls Dam on the outlet of Lake Pend Oreille.

6.2.5 Expedite Flathead Agency Irrigation District Biological Opinion. Expedite a Biological Assessment and Biological Opinion for the Flathead Agency Irrigation Project to eliminate the existing take.

6.2.6 Implement Plum Creek Habitat Conservation Plan. Carry out compliance monitoring and U.S. Fish and Wildlife Service

commitment to adaptive management planning under the Plum Creek Native Fish Habitat Conservation Plan.

6.3 Evaluate enforcement of existing Federal and State habitat protection standards and regulations and evaluate their effectiveness for bull trout conservation.

6.3.1 Fully implement State and Tribal habitat protection laws. Fully implement the Montana Streamside Management Zone Law (1993), Montana Stream Protection Act (1965), Montana Natural Streambed and Land Preservation Act (1975), Idaho Forest Practices Act (1974), Idaho Lake Protection Act (1973), Idaho Stream Channel Protection Act (1967), and Idaho Code 36-906 addressing fish passage (pre-1900) to maximize legal protection of bull trout habitat under State law and evaluate the effectiveness of these laws in conserving bull trout habitat.

6.3.2 Encourage floodplain protection. Encourage local governments to develop, implement, and promote restrictive regulations for floodplains to mitigate extensive habitat loss and stream encroachment from rural residential development throughout the lower Clark Fork River drainage because these and other effects of development exacerbate temperature problems, increase nutrient loads, decrease bank stability, alter instream and riparian habitat, and change hydrologic response of affected watersheds.

7 Assess the implementation of bull trout recovery by recovery units and revise recovery unit plans based on evaluations.

FLATHEAD RECOVERY SUBUNIT

1 Protect, restore, and maintain suitable habitat conditions for bull trout.

1.1 Maintain or improve water quality in bull trout core areas or potential core habitat.

1.1.1 Reduce general sediment sources. Stabilize roads, stream crossings, trails, natural landslides, and other sources of sediment delivery. Priority watersheds include Big, Coal, Trail, Red Meadow, and Whale Creeks and the North Fork Flathead River; Cauldrey, Howell, and Kishinehn Creeks and the British Columbia portion of the (North Fork) Flathead River; Cold, Elk, Goat, Jim, Kraft, Lion, Lost, Piper, Squeezer, and Woodward Creeks and the Swan River; Granite Creek and the Middle Fork Flathead River; Quintonkon, Sullivan, Wheeler, and Wounded Buck Creeks and the South Fork Flathead River; tributaries to Cyclone, Frozen, Holland, Lindbergh, McDonald, and Tally Lakes; Swift Creek and the Whitefish River; the Stillwater River drainage; and the mainstem Flathead River.

1.1.2 Address forest road maintenance and hotspots. Increase maintenance of extensive secondary road systems on U.S. Forest Service, Plum Creek Timber Company, and State lands by increased application of best management practices, with emphasis on remediating sediment-producing hotspots and maintaining bridges, culverts, and crossings in drainages that support bull trout spawning and rearing. Decommission surplus forest roads, especially those that are chronic sources of sediment and those that are located in areas of highly erodible geological formations. Remove culverts and bridges on closed roads that are no longer maintained.

1.1.3 Improve maintenance along transportation corridors. Improve maintenance of all major roads and railroads along riparian corridors to reduce impacts of sediment and floodplain encroachment. When reconstruction occurs, advocate moving major problem reaches out of riparian corridors. Improve

capability for quick response for dealing with potential hazardous material spills (especially on Highway 93, Highway 2 east of Kalispell, the North Fork Flathead River, Swan Highway, and major east–west rail lines).

1.1.4 Modify problem reaches of trail system. Improve or relocate portions of the U.S. Forest Service and Glacier National Park trail system to eliminate stream crossings in known bull trout spawning reaches (*e.g.*, Granite Creek on the Middle Fork Flathead River) and minimize human activity at these locations.

1.1.5 Monitor existing and future coal mine development in British Columbia. Monitor sediment and potential acid mining runoff related to existing and proposed coal mining activities in the British Columbia portion of the North Fork Flathead River.

1.1.6 Minimize recreational development in bull trout spawning and rearing habitat. Minimize impacts from expansion or development of new golf courses, ski areas, campgrounds, fishing access sites, and second home or other recreational developments in the corridors of bull trout spawning and rearing streams.

1.1.7 Assess nutrient input and increase water quality monitoring and remediation. Assess and continue to address effects of nutrient enrichment from municipal sewage plants, agriculture, forestry, and development of lakeshores. Increase water quality monitoring in major lake basins (*e.g.*, Flathead, Swan, Whitefish, McDonald). Focus water quality remediation efforts on rapidly developing and implementing total maximum daily load programs for impaired water bodies (section 303[d] list) that contain bull trout.

1.1.8 Implement water quality regulations. Evaluate enforcement of water quality standards and implement total maximum daily load program.

1.2 Identify barriers or sites of entrainment for bull trout and implement tasks to provide passage and eliminate entrainment.

1.2.1 Eliminate entrainment in diversions. Screen both water diversions and irrigation ditches or remove those that are no longer needed.

1.2.2 Provide fish passage around diversions. Install appropriate fish passage structures around diversions and/or remove related migration barriers. Consider native fish genetic concerns and the potential for invasion by nonnatives (*e.g.*, Bigfork Dam) when making evaluations.

1.2.3 Eliminate culvert barriers. Monitor road crossings for blockages to upstream passage and, where beneficial to native fish, replace or remove existing culverts or bridges that impede passage. Consider native fish genetic concerns and the potential for invasion by nonnatives when making evaluations. The following drainages are of highest priority for this task: Big, Coal, Trail, Red Meadow, and Whale Creeks in the North Fork Flathead River drainage; Cauldrey, Howell, and Kishinehn Creeks and the British Columbia portion of the mainstem (North Fork) Flathead River; Cold, Elk, Fatty, Goat, Jim, Kraft, Lion, Lost, Piper, Soup, Squeezer, and Woodward Creeks in the Swan River drainage; Clark, Paola, and Tunnel Creeks in the Middle Fork Flathead River drainage; Quintonkon, Sullivan, Wheeler, and Wounded Buck Creeks in the South Fork Flathead River drainage; tributaries to Cyclone, Frozen, Holland, Lindbergh, McDonald, and Tally Lakes; Swift Creek and the Whitefish River; and the Stillwater River drainage.

1.2.4 Improve instream flows. Restore connectivity and opportunities for migration by securing or improving instream flows and acquiring or leasing water rights from willing sellers. The highest-priority streams are those with bull trout spawning and rearing.

1.3 Identify impaired stream channel and riparian areas and implement tasks to restore their appropriate functions.

1.3.1 Conduct watershed problem assessments. Identify site-specific threats (problem assessment) that may be limiting bull trout in watersheds that have not already been evaluated. Evaluate adfluvial populations in Akokala, Arrow, Big Salmon, Bowman, Cerulean, Cyclone, Doctor, Frozen, Harrison, Holland, Isabel, Kintla (2), Lindbergh, Logging, McDonald, Quartz (3), Stillwater (2), Tally, Trout, Upper Whitefish, and Whitefish Lakes and quantify population numbers, trends, and extent of habitat used.

1.3.2 Revegetate denuded riparian areas. Revegetate past riparian harvest zones to restore shade and canopy, riparian cover, and native vegetation.

1.3.3 Improve grazing practices. Reduce negative effects of grazing by fencing riparian areas or improving management practices. Priority watersheds include Hay Creek in the North Fork Flathead River drainage and Logan Creek (Tally Lake).

1.3.4 Restore stream channels. Conduct stream channel restoration activities where evaluation indicates that such activities are necessary to restore proper stream function and only where similar results cannot be achieved by other, less costly and less intrusive means. Priority watersheds include Bear Creek in the Middle Fork Flathead drainage.

1.3.5 Improve instream habitat. Increase or improve instream habitat by restoring recruitment of large woody debris or by initiating other appropriate methods. Streams include Big, Coal, Red Meadow, and Whale Creeks in the North Fork Flathead River drainage and Bear Creek in the Middle Fork Flathead River drainage.

1.3.6 Minimize potential stream channel degradation. Ensure that negative effects to bull trout of ongoing flood control and streambank stabilization activities (*e.g.*, riprap, dredging, channel clearing) are minimized.

1.4 Operate dams to minimize negative effects on bull trout.

1.4.1 Reduce reservoir operational impacts. Review Flathead Lake and Hungry Horse Reservoir operational concerns (*e.g.*, water level manipulation) and support operating recommendations that provide enforceable drawdown limits and refill guidelines through Federal Energy Regulatory Commission license (Kerr) and/or Federal consultation (Hungry Horse Reservoir; USFWS Biological Opinion). The Variable Flow Flood Control model should be implemented by water managers to provide comprehensive, long-term, balanced, and predictable allocation of water resources from Hungry Horse Reservoir that will limit the duration and frequency of deep reservoir drawdowns, improve reservoir refill probability, and produce a more naturally shaped dam discharge pattern downstream (USFWS 2000). Once implemented, these strategies must be evaluated to determine the effects on bull trout recovery.

1.4.2 Provide instream flow downstream of dams. Maintain or exceed recommended instream flow levels in the lower South Fork Flathead River (USFWS 2000), using results of current research, and minimize peaking flows in the mainstem Flathead River

downstream of Hungry Horse Dam. Consider bull trout concerns when developing flood control release patterns.

1.4.3 Evaluate selective withdrawal at Hungry Horse Dam. Evaluate the adequacy of the selective withdrawal system in partially restoring the normal summer thermal regime in the Flathead River downstream of Hungry Horse Dam and assess whether it meets the needs of migratory bull trout. Refine operations if necessary.

1.4.4 Avoid gas supersaturation from Hungry Horse Dam. Avoid conditions for potential gas entrainment to cause nitrogen supersaturation below Hungry Horse Dam that is detrimental to bull trout.

1.4.5 Evaluate impact of dam operations on bull trout predators. Continue research on response of introduced predators (*i.e.*, lake trout and northern pike) to Flathead Lake and Flathead River water level and temperature manipulations and provide recommendations for operation of Hungry Horse and Kerr Dams to favor native species.

1.5 Identify upland conditions that negatively affect bull trout habitats and implement tasks to restore appropriate functions.

1.5.1 Monitor fire effects and mitigate effects where necessary. Monitor effects from wild fires and pursue habitat restoration actions where warranted.

2 Prevent and reduce negative effects of nonnative fishes and other nonnative taxa on bull trout.

2.1 Develop, implement, and evaluate enforcement of policies for public and private fish stocking to reduce stocking of nonnative fishes that affect bull trout.

2.1.1 Upgrade fish hatchery practices. Evaluate all fish-stocking programs and private and public hatchery practices to minimize the risk of further inadvertent introduction of nonnative species, strains, or pathogens to the Flathead River drainage.

2.1.2 Regulate private fish ponds. Reduce the risks of inadvertent introduction of nonnative species from private fish ponds by closely regulating existing permits to ensure that only permitted species are stocked and that fish barriers are maintained and by attaching conditions to future permits.

2.1.3 Encourage development of commercial sources of westslope cutthroat trout. Develop and maintain an approved and available source of genetically diverse native westslope cutthroat trout for private pond stocking. Follow stocking guidelines developed by the Montana Westslope Cutthroat Trout Technical Committee.

2.2 Evaluate policies for preventing illegal transport and introduction of nonnative fishes.

2.2.1 Optimize enforcement of laws and policies that prohibit unauthorized fish transplant and stocking. Strengthen enforcement of existing laws and continue to work to improve the legal and policy framework for preventing unauthorized fish transplant and stocking.

2.3 Inform the public about ecosystem concerns of illegal introductions of nonnative fishes.

2.3.1 Discourage unauthorized fish introductions. Focus an intensive public education campaign in the Flathead River basin to reduce the rampant spread of nonnative fish species; to date at least 220 unauthorized introductions have occurred into 121 waters in

northwest Montana. Strong enforcement of existing laws prohibiting illegal introduction is needed.

2.3.2 Develop bull trout education program. Develop public information program with a broad emphasis on bull trout ecology and life history requirements and a more specific focus on regionally or locally important recovery issues.

2.4 Evaluate biological, economic, and social effects of control of nonnative fishes.

2.4.1 Develop protocols for suppressing nonnative fish. Conduct research and develop protocols to describe the most effective methods for suppressing or eradicating nonnative fish populations from waters where they negatively impact bull trout recovery, with emphasis on lake trout, brook trout, and northern pike.

2.4.2 Discourage illegally introduced sport fish populations. Adopt an aggressive approach to angling regulations and fisheries management that avoids legitimizing fisheries for illegally established populations of nonnative fish and that supports minimizing the presence of and/or removing illegally introduced fish.

2.5 Implement control of nonnative fishes where found to be feasible and appropriate.

2.5.1 Experimentally remove established brook trout populations. Evaluate opportunities for, and conduct experimental removal of, brook trout from selected streams and lakes. Priority watersheds include Bear Creek (Middle Fork Flathead River) and selected sites within the Swan River and upper Stillwater River drainages.

2.5.2 Suppress brown trout in Mill Creek. Remove newly established reproducing brown trout population from Mill Creek in the Flathead River drainage.

2.6 Develop tasks to reduce negative effects of nonnative taxa on bull trout.

2.6.1 Reduce/minimize impacts of northern pike. Evaluate and, if warranted, control expansion of northern pike in the Flathead River and associated sloughs or other waters to minimize predation on bull trout.

2.6.2 Consider installing barriers to hinder spread of nonnative fish. In portions of the Flathead Recovery Subunit, threats of invasion in isolated lakes by nonnative fish, especially lake trout from downstream, may exceed concerns over fragmentation due to barriers. In some such situations, consider barrier installation downstream of vulnerable adfluvial bull trout populations: for example, Frozen, Cyclone, Holland, Lindbergh, and Quartz Lakes.

3 Establish fisheries management goals and objectives compatible with bull trout recovery and implement practices to achieve goals.

3.1 Develop and implement State and Tribal native fish management plans integrating adaptive research.

3.1.1 Implement adaptive management of native fishes in Flathead Lake and Flathead River. Implement the Flathead Lake and River Co-Management Plan so that it accommodates bull trout recovery goals and minimizes the emigration of lake trout upstream and downstream through the Flathead River system. Monitor and evaluate the effectiveness of the management plan in meeting bull trout recovery goals and make adaptive changes, if necessary.

Continue assessment of predator–prey interactions in Flathead Lake, with emphasis on lake trout.

3.1.2 Develop and implement a Swan Lake management strategy. Develop and implement a management strategy for Swan Lake that seeks to eliminate recently discovered individual lake trout by whatever means possible. Intensify management activities to protect bull trout if lake trout are found to establish or reproduce. Maintain Bigfork Dam as an upstream fish barrier.

3.1.3 Aggressively protect remaining native species complexes. Manage the lakes thought to contain uncompromised adfluvial bull trout populations (*i.e.*, currently not known to contain extensive populations of competing nonnative species) to minimize the risk of nonnative fish introductions; use aggressive protective regulations and information and education campaigns. Lakes include Akokala, Arrow, Big Salmon, Cerulean, Cyclone, Doctor, Frozen, Isabel, Lower Quartz, Middle Quartz, Trout, Upper Kintla, Upper Quartz, and Upper Whitefish Lakes.

3.2 Evaluate and prevent overharvest and incidental angling mortality of bull trout.

3.2.1 Minimize unintentional bull trout mortality. Montana Fish, Wildlife and Parks; Confederated Salish and Kootenai Tribes; and Glacier National Park should continue to develop and implement sport angling regulations and fisheries management plans, guidelines, and policies that minimize incidental mortality of bull trout.

3.2.2 Evaluate enforcement of angling regulations and oversee scientific research. Ensure compliance with angling regulations and Federal, State, and Tribal policies for scientific collection and target bull trout spawning and staging areas for enforcement.

Poaching is a particularly sensitive problem in the recovery subunit due to the vulnerability of large migratory spawners from Flathead, Holland, Swan, Lindbergh, and other lakes.

3.2.3 Implement angler education efforts. Inform anglers about special regulations and how to identify bull trout and reduce hooking mortality of bull trout that are caught incidentally in Flathead Lake, the Flathead River and tributaries, and other fisheries.

3.2.4 Solicit information from commercial guides. Develop a reporting system to collect information on bull trout that are caught and released from charter boats and by commercial fishing guides on Flathead Lake and the Flathead and Swan Rivers.

3.2.5 Coordinate with British Columbia fisheries monitoring and management authorities. Continue close communication with the British Columbia Ministry of Environment to carefully monitor the potential effects of the bull trout fishery and management program in the Flathead River in British Columbia.

3.3 Evaluate potential effects of introduced fishes and associated sport fisheries on bull trout recovery and implement tasks to minimize negative effects on bull trout.

3.3.1 Evaluate site-specific conflicts with introduced sport fish. Determine the site-specific level of predation, competition, and hybridization of bull trout with introduced sport fish (especially lake trout, brook trout, and northern pike) and take management actions to minimize the effects of those interactions while maintaining or restoring a viable bull trout population in lakes that are currently at risk, including Bowman, Harrison, Holland, Kintla, Lindbergh, Logging, Lake McDonald, Upper and Lower Stillwater, Tally, and Whitefish Lakes. Evaluate and implement

site-specific opportunities to eliminate nonnatives and restore native fish communities in Glacier National Park lakes.

3.4 Evaluate effects of existing and proposed sport fishing regulations on bull trout.

3.4.1 Evaluate opportunities for regulated bull trout fisheries. Evaluate management proposals to allow carefully regulated fisheries for, and potential harvest of, bull trout (in Hungry Horse Reservoir, in accordance with the existing Conservation Agreement, or in other waters) where monitoring of the population status provides a clear record that a harvestable surplus can be maintained and that such harvest will benefit, or at least not be detrimental to, recovery goals. Such fisheries may provide a unique opportunity to fish for native species that anglers will value and, consequently, may help protect these waters from unauthorized introductions.

4 Characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout.

4.1 Incorporate conservation of genetic and phenotypic attributes of bull trout into recovery and management plans.

4.1.1 Conduct genetic inventory. Continue coordinated genetic inventory and protect genetic diversity throughout recovery subunit, with emphasis on analyzing bull trout from adfluvial core areas and assessing the hybridization threat with brook trout. Core areas include Akokala, Arrow, Big Salmon, Bowman, Cerulean, Cyclone, Doctor, Frozen, Harrison, Holland, Isabel, Kintla (2), Lindbergh, Logging, Lake McDonald, Quartz (3), Stillwater (2), Tally, Trout, Upper Whitefish, and Whitefish Lakes.

4.2 Maintain existing opportunities for gene flow among bull trout populations.

4.3 Develop genetic management plans and guidelines for appropriate use of transplantation and artificial propagation.

5 Conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks.

5.1 Design and implement a standardized monitoring program to assess the effectiveness of recovery efforts affecting bull trout and their habitats.

5.1.1 Develop standardized monitoring procedures. Conduct in-depth statistical analysis of existing bull trout databases for the Flathead River and Swan River populations (including redd counts and juvenile abundance estimates over the past 20 years) to validate and interpret trends, assess potential information gaps, and identify future monitoring needs. Continue to conduct annual index monitoring to support and expand long-term database. Develop standardized bull trout monitoring procedures to apply throughout the Clark Fork Recovery Unit.

5.2 Conduct research evaluating relationships among bull trout distribution and abundance, bull trout habitat, and recovery tasks.

5.2.1 Identify suitable unoccupied habitat. Identify suitable unoccupied habitat, if any. Within five years, complete a comprehensive list of all known passage barriers that prevent upstream-migrating bull trout from accessing suitable habitat.

5.2.2 Map spawning habitat. Develop a comprehensive map of primary tributary reaches of bull trout spawning for focusing habitat protection and recovery efforts.

5.3 Conduct evaluations of the adequacy and effectiveness of current and past best management practices in maintaining or achieving habitat conditions conducive to bull trout recovery.

5.4 Evaluate effects of diseases and parasites on bull trout and develop and implement strategies to minimize negative effects.

5.4.1 Monitor fish health in private hatcheries. Closely regulate fish health in private hatcheries that supply fish for private ponds (State and Federal hatcheries are already closely monitored).

5.4.2 Prevent spread of fish pathogens. Survey and evaluate fish health before implementing new fish passage projects.

5.5 Develop and conduct research and monitoring studies to improve information concerning the distribution and status of bull trout.

5.5.1 Increase monitoring of adfluvial bull trout populations in smaller lakes. Increase monitoring of adfluvial populations to determine population status, distribution, movement, and seasonality of use of different habitat types by adult and subadult bull trout in the following lakes and their watersheds: Akokala, Arrow, Bowman, Cerulean, Cyclone, Doctor, Frozen, Harrison, Holland, Isabel, Kintla (2), Lindbergh, Logging, McDonald, Quartz (3), Stillwater (2), Trout, Upper Whitefish, and Whitefish Lakes.

5.5.2 Evaluate bull trout population and habitat in Tally Lake watershed to determine potential core area status. Bull trout have been historically documented in low numbers in this lake, but there is a natural barrier on the lower reaches of the inlet stream (Logan Creek) and whether the accessible portion of Logan Creek ever provided suitable spawning and rearing habitat is uncertain. Presence of bull trout may have been only incidental, a result of upstream migration in the Stillwater River system. Verification of historical presence and abundance, as well as of historical habitat suitability, is needed to determine core area status of this water.

5.6 Identify evaluations needed to improve understanding of relationships among genetic characteristics, phenotypic traits, and local populations of bull trout.

5.6.1 Investigate status of migratory and resident life history forms of bull trout. Investigate potential existence of fluvial or resident bull trout populations in the Flathead River and Swan River tributaries, where only adfluvial migrants have previously been documented.

5.6.2 Assess hybridization threat with brook trout in the Swan River drainage. Assess significance of brook trout hybridization in the Swan River drainage and establish benchmarks to measure and/or prevent any further increase in the rate of hybridization.

6 Use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats.

6.1 Use partnerships and collaborative processes to protect, maintain, and restore functioning core areas for bull trout.

6.1.1 Support watershed group restoration efforts. Support collaborative efforts by local watershed groups to accomplish site-specific protection/restoration activities consistent with this recovery plan. The Swan River drainage is a priority because of its strong status of existing bull trout populations, the diverse mixture of public and private lands, and the pressures of rapidly expanding development. A draft total maximum daily load program is being developed in the Swan River drainage, relying upon an methodology based on assessment of road-induced sedimentation and instream sediment sources.

6.1.2 Protect habitat. Provide long-term habitat protection on State and private lands through habitat conservation plans, land exchanges, purchases, conservation easements, management plans, and other methods. Emphasis should be on identified bull trout spawning and rearing streams.

6.1.3 Support habitat protection and monitoring in British Columbia. Work collaboratively with the British Columbia Ministry of Environment and other Canadian governmental and nongovernmental entities to ensure that bull trout habitat is protected and enhanced in the Flathead River watershed upstream of the international border.

6.2 Use existing Federal authorities to conserve and restore bull trout.

6.2.1 Monitor compliance with Kerr Dam Federal Energy Regulatory Commission Order and Biological Opinion. Monitor compliance with the Order of the Federal Energy Regulatory Commission (and the Biological Opinion of the U.S. Fish and Wildlife Service) for operations of Kerr Dam and ensure that recovery needs of bull trout are met.

6.2.2 Minimize impacts of Bigfork Dam through Federal Energy Regulatory Commission relicensing process. Minimize impacts of Bigfork Dam operations on bull trout (*e.g.*, entrainment) through the relicensing process of the Federal Energy Regulatory Commission and through compliance with Biological Opinion of the U.S. Fish and Wildlife Service.

6.2.3 Monitor compliance with Federal Columbia River Power System Biological Opinion for Hungry Horse Dam. Monitor compliance with the Biological Opinion for Federal Columbia River Power System operations of Hungry Horse Dam and evaluate effectiveness in conserving bull trout.

6.2.4 Implement Plum Creek Habitat Conservation Plan. Carry out compliance monitoring and U.S. Fish and Wildlife Service commitment to adaptive management planning under the proposed Plum Creek Native Fish Habitat Conservation Plan, with emphasis on the Swan River basin due to concentrated Plum Creek Timber Company land holdings.

6.3 Evaluate enforcement of existing Federal and State habitat protection standards and regulations and evaluate their effectiveness for bull trout conservation.

6.3.1 Fully implement State and Tribal habitat protection laws. Fully implement the Montana Streamside Management Zone Law (1993), Montana Stream Protection Act (1965), Montana Natural Streambed and Land Preservation Act (1975), and Montana Water Quality Act (1997) to maximize legal protection of bull trout habitat under State law and evaluate the effectiveness of these laws in conserving bull trout habitat.

6.3.2 Encourage floodplain protection. Encourage local and Confederated Salish and Kootenai Tribal governments to develop, implement, and promote restrictive regulations to protect floodplains and lakeshores in Flathead, Lake, and Missoula Counties to mitigate extensive habitat loss and stream encroachment from rural residential development throughout the Flathead River drainage. These effects and others related to development are of particular concern in watersheds that support bull trout spawning and rearing because they exacerbate temperature problems, increase nutrient loads, decrease bank stability, and alter instream and riparian habitat.

7 Assess the implementation of bull trout recovery by recovery units and revise recovery unit plans based on evaluations.

PRIEST RECOVERY SUBUNIT

1 Protect, restore, and maintain suitable habitat conditions for bull trout.

1.1 Maintain or improve water quality in bull trout core areas or potential core habitat.

1.1.1 Reduce general sediment sources. Stabilize roads, stream crossings, trails, natural landslides, and other sources of sediment delivery in the Priest River drainage, where sedimentation is especially problematic because of the prevalence of highly erodible soil types and rain-on-snow events. Priority watersheds are those with known bull trout populations, including Granite, Lion, Trapper, and Two Mouth Creeks; and the Upper Priest River and its tributaries.

1.1.2 Address forest road maintenance and hotspots. Emphasize maintenance of extensive secondary road systems of U.S. Forest Service and State lands by increased application of best management practices, with focus on remediating sediment-producing hotspots and maintaining bridges, culverts, and crossings in drainages supporting bull trout spawning and rearing. Decommission surplus forest roads, especially those that are chronic sources of sediment and/or those that are located in areas of highly erodible geological formations. Remove culverts and/or bridges on closed roads that are no longer maintained. The Idaho Department of Lands has made significant efforts in this arena, but areas that will continue to require particular attention include portions of the drainages of Hughes Fork and Indian, Kalispell, Lion, Soldier, and Two Mouth Creeks.

1.1.3 Improve maintenance along transportation corridors. Improve maintenance of all major roads along riparian corridors to reduce impacts of sediment and floodplain encroachment. When reconstruction occurs on roads that are in the floodplain, advocate

moving major problem reaches out of riparian corridors. Improve the capability of quick response for dealing with potential hazardous material spills.

1.1.4 Minimize recreational development in bull trout spawning and rearing habitat. Minimize impacts from expansion or development of new golf courses, ski areas, campgrounds, fishing access sites, and second home or other recreational developments in the corridors of bull trout spawning and rearing streams.

1.1.5 Assess and reduce nutrient input from forestry practices and lakeshore development. Assess and continue to address effects of nutrient enrichment from forestry practices and lakeshore development. Continue to monitor water quality in the Priest River basin. Focus water quality remediation efforts on rapidly implementing total maximum daily load programs for impaired water bodies that contain bull trout (section 303[d] list includes Kalispell, Trapper, and Two Mouth Creeks).

1.1.6 Implement water quality regulations. Evaluate enforcement of water quality standards and implement total maximum daily load program.

1.2 Identify barriers or sites of entrainment for bull trout and implement tasks to provide passage and eliminate entrainment.

1.2.1 Eliminate culvert barriers. Monitor stream crossings for blockages to upstream passage and replace or remove existing culverts or bridges that impede passage. Problem areas have been identified on Granite Creek, Hughes Fork, Kalispell Creek, and South Fork Granite Creek.

1.2.2 Improve instream flows. Restore connectivity and opportunities for migration by securing or improving instream flows and acquiring water rights; the highest priority should be assigned to bull trout

spawning and rearing streams. Kalispell Creek has currently been identified as one such stream with intermittent dewatering problems.

1.3 Identify impaired stream channel and riparian areas and implement tasks to restore their appropriate functions.

1.3.1 Conduct watershed problem assessments. Identify site-specific threats (problem assessment) that may be limiting bull trout in watersheds that have not already been evaluated. In particular, quantify population numbers, trends, and extent of habitat used in the following watersheds: Caribou Creek, Granite Creek, Hughes Fork, Indian Creek, Kalispell Creek, Upper Priest River, Priest River, and Soldier Creek. Assessments have been completed in Lion, Trapper, and Two Mouth Creeks.

1.3.2 Revegetate denuded riparian areas. Develop site-specific plans to promote revegetation of past riparian harvest zones (and some other stream sections lacking woody vegetation for other reasons) to ensure sufficient shade and canopy, large woody debris recruitment, riparian cover, and native vegetation to support native salmonids. Highest-priority streams are those with existing bull trout populations.

1.3.3 Improve grazing practices. Reduce negative effects of grazing with riparian fencing or improved management practices. Problems in the Priest River drainage are restricted to a few isolated locations that are not generally associated with bull trout spawning and rearing streams.

1.3.4 Restore stream channels. Conduct stream channel restoration activities, but only where similar results cannot be achieved by other, less costly and less intrusive means. Priority watersheds include the Hughes Fork downstream of Hughes Meadow.

1.3.5 Improve instream habitat. Explore opportunities to improve instream habitat by increasing amounts of large woody debris (*e.g.*, on lower Hughes Fork and Caribou, Granite, Indian, Kalispell, Lion, and Two Mouth Creeks).

1.3.6 Minimize potential stream channel degradation. Ensure that negative effects to bull trout from ongoing flood control and streambank stabilization activities (*e.g.*, riprap, dredging, channel clearing) are minimized, in part through implementing the U.S. Army Corps of Engineers 404 program and the Idaho Stream Channel Protection Act.

1.4 Operate dams to minimize negative effects on bull trout.

1.4.1 Minimize impacts of dam operations on bull trout in Priest Lake. Review operations of Priest Lake Outlet Structure and support operating recommendations that minimize effects on bull trout, including two-way fish passage and adequate instream flows.

1.4.2 Minimize impacts of Albeni Falls Dam on bull trout in the Priest River. Review Lake Pend Oreille operational concerns (*e.g.*, water level manipulation that may affect free passage or habitat quality in the lower Priest River) and include operating recommendations through Federal consultation for Lake Pend Oreille that are consistent with needs of bull trout in the Priest River system.

1.4.3 Provide upstream passage over barriers. Investigate and implement upstream fish passage at Albeni Falls Dam and over the Priest Lake Outlet Structure, as needed, to reconnect fragmented bull trout core habitat with Lake Pend Oreille.

1.5 Identify upland conditions that negatively affect bull trout habitats and implement tasks to restore appropriate functions.

1.5.1 Monitor fire effects and mitigate effects where necessary. Monitor effects from wild fires and pursue habitat restoration actions where warranted.

2 Prevent and reduce negative effects of nonnative fishes and other nonnative taxa on bull trout.

2.1 Develop, implement, and evaluate enforcement of public and private fish stocking policies to reduce stocking of nonnative fishes that affect bull trout.

2.1.1 Review fish stocking programs. Evaluate all fish-stocking programs and private and public hatchery practices to minimize the risk of further inadvertent introduction of nonnative species to the Priest River drainage.

2.1.2 Regulate private fish ponds. Reduce the risks of inadvertent introduction of nonnative fish from private fish ponds by closely regulating existing permits to ensure that only permitted species are stocked and that fish barriers are maintained and by attaching conditions to future permits.

2.1.3 Encourage development of commercial sources of westslope cutthroat trout. Support development of approved and available sources of genetically diverse native westslope cutthroat trout for private pond stocking.

2.2 Evaluate policies for preventing illegal transport and introduction of nonnative fishes.

2.2.1 Optimize enforcement of laws and policies that prohibit unauthorized fish transplant and stocking. Strengthen enforcement of existing laws and continue to work to improve the legal and policy framework for preventing unauthorized fish transplant and stocking.

2.3 Inform the public about ecosystem concerns of illegal introductions of nonnative fishes.

2.3.1 Discourage unauthorized fish introductions. Focus an intensive public education campaign on the Priest Lake basin to reduce the potential spread of illegally introduced nonnative fish species.

2.3.2 Develop bull trout education program. Develop a public information program with a broad emphasis on bull trout ecology and life history requirements and a more specific focus on regionally or locally important recovery issues.

2.4 Evaluate biological, economic, and social effects of control of nonnative fishes.

2.4.1 Develop protocols for suppressing nonnative fish. Conduct research and develop protocols to describe the most effective methods for suppressing or eradicating nonnative fish populations from waters where they negatively impact bull trout recovery, with emphasis on lake trout and brook trout in the Priest Lakes system.

2.4.2 Evaluate site-specific conflicts with introduced sport fish. Determine the site-specific level of predation, competition, and hybridization of bull trout with introduced sport fish (especially lake trout and brook trout) and take management actions to minimize the effects of those interactions, while maintaining or restoring a viable bull trout population in Priest Lake that is sufficiently large to protect the genetic integrity of the local population(s).

2.5 Implement control of nonnative fishes where found to be feasible and appropriate.

2.5.1 Experimentally remove established brook trout populations. Evaluate opportunities for experimental removal of brook trout

from selected streams. Priority watersheds include those in the Upper Priest Lake basin, particularly Rock and Ruby Creeks, and others identified as bull trout spawning and rearing streams.

2.5.2 Evaluate the potential for a barrier in the Thorofare to control the migration of nonnative fish. Investigations in Upper Priest Lake have indicated that aggressive netting could effectively control lake trout, but that rapid reinvasion by lake trout occurs from downstream Priest Lake. Risks to bull trout from the lake trout invasion currently exceed concerns over fragmentation from barriers. For this situation, consider installing a partial (perhaps seasonal or selective) fish barrier in the Thorofare between Upper Priest and Priest Lakes to protect Upper Priest Lake's vulnerable adfluvial bull trout populations.

2.6 Develop tasks to reduce negative effects of nonnative taxa on bull trout.

3 Establish fisheries management goals and objectives compatible with bull trout recovery and implement practices to achieve goals.

3.1 Develop and implement State and Tribal native fish management plans integrating adaptive research.

3.1.1 Implement adaptive management to address lake trout in Lake Pend Oreille and Priest Lake. Continue assessing predator–prey interactions in Lake Pend Oreille and Priest Lake, with emphasis on lake trout. Continue analysis of options for using commercial-type fishing gear to reduce lake trout numbers. In Priest Lake, implement actions to reduce lake trout numbers.

3.1.2 Aggressively protect remaining native species complexes. Maximize efforts to suppress and, if possible, eliminate lake trout from Upper Priest Lake. Consider all potential methods to negate lake trout immigration, including design and strategies for funding and installing a downstream fish barrier to prevent immigration.

Manage Upper Priest Lake to minimize nonnative fish populations by using aggressive protective regulations for native species, liberal limits on nonnatives, and information and education campaigns.

3.2 Evaluate and prevent overharvest and incidental angling mortality of bull trout.

3.2.1 Minimize unintentional bull trout mortality. The Idaho Department of Fish and Game and the Washington Department of Fish and Wildlife should continue to develop and implement sport angling regulations and fisheries management plans, guidelines, and policies that minimize incidental mortality of bull trout, particularly in the Priest Lakes and the Priest River.

3.2.2 Evaluate enforcement of angling regulations and oversee scientific research. Ensure compliance with angling regulations and scientific collection policies and target enforcement efforts at known bull trout spawning and staging areas.

3.2.3 Implement angler education efforts. Inform anglers about special regulations (*e.g.*, on Upper Priest Lake) and how to identify bull trout and reduce hooking mortality of bull trout caught incidentally in the Priest River system.

3.2.4 Solicit information from commercial guides. Develop a reporting system to collect information on bull trout that are caught and released from charter boats and by commercial fishing guides on Priest Lake.

3.3 Evaluate potential effects of introduced fishes and associated sport fisheries on bull trout recovery and implement tasks to minimize negative effects on bull trout.

3.3.1 Discourage illegally introduced sport fish populations. Adopt an aggressive approach to angling regulations and fisheries

management that actively avoids legitimizing fisheries for illegally established populations of nonnative fish in the future and that supports minimizing the presence of and/or removing illegally introduced fish.

3.4 Evaluate effects of existing and proposed sport fishing regulations on bull trout.

3.4.1 Encourage brook trout harvest. Develop and maintain regulations that prescribe liberal bag limits on brook trout throughout the Priest River watershed.

4 Characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout.

4. Incorporate conservation of genetic and phenotypic attributes of bull trout into recovery and management plans.

4.1.1 Conduct genetic inventory. Conduct coordinated genetic inventory and protect genetic diversity throughout the recovery subunit, with emphasis on analyzing bull trout from the Upper Priest River watershed where hybridization with brook trout presents the most imminent threat.

4.2 Maintain existing opportunities for gene flow among bull trout populations.

4.3 Develop genetic management plans and guidelines for appropriate use of transplantation and artificial propagation.

4.3.1 Implement actions to develop a refugia for Priest Lakes. Develop plans for captive propagation or other methods of maintaining genetic viability of declining bull trout population in Priest Lakes.

5 Conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks.

5.1 Design and implement a standardized monitoring program to assess the effectiveness of recovery efforts affecting bull trout and their habitats.

5.1.1 Develop standardized monitoring procedures. Develop standardized strategies for bull trout redd counts and juvenile monitoring to track bull trout populations in the Priest River watershed, including Gold Creek, Hughes Fork, Trapper Creek, and Upper Priest River. Apply these strategies throughout the Clark Fork Recovery Unit.

5.1.2 Increase monitoring of adfluvial bull trout populations in Priest Lakes. Increase monitoring of adfluvial populations to determine population status, distribution, movement, and seasonality of use of different habitat types by adult and subadult bull trout in and between the lakes.

5.1.3 Increase lake water quality monitoring. Support increased water quality monitoring efforts in Priest Lakes to protect existing high standards and to better understand potential linkages between water quality, lakeshore development, and bull trout requirements.

5.2 Conduct research evaluating relationships among bull trout distribution and abundance, bull trout habitat, and recovery tasks.

5.2.1 Identify suitable unoccupied habitat. Identify suitable unoccupied habitat, if any, in the Priest Lake watershed that might be reconnected or enhanced to increase recruitment of bull trout to the system. Within five years, complete a comprehensive list of all known passage barriers that prevent upstream-migrating bull trout from accessing suitable habitat. Consider establishing resident bull

trout populations upstream of natural barriers to provide a genetic reserve.

5.2.2 Map spawning habitat. Develop a comprehensive map of primary tributary reaches of bull trout spawning for focusing habitat protection and recovery efforts.

5.2.3 Evaluate core area classification status. The classification of the Priest Lakes and Priest River as a primary core area should be reviewed to determine whether recovery of bull trout abundance to a level consistent with primary core status (*i.e.*, 1,000 adult fish) is feasible.

5.3 Conduct evaluations of the adequacy and effectiveness of current and past best management practices in maintaining or achieving habitat conditions conducive to bull trout recovery.

5.4 Evaluate effects of diseases and parasites on bull trout and develop and implement strategies to minimize negative effects.

5.5 Develop and conduct research and monitoring studies to improve information concerning the distribution and status of bull trout.

5.6 Identify evaluations needed to improve understanding of relationships among genetic characteristics, phenotypic traits, and local populations of bull trout.

5.6.1 Investigate status of migratory and resident life history forms. Investigate potential existence of fluvial or resident bull trout populations in the Priest River tributaries where adfluvial migrants previously dominated.

5.6.2 Assess hybridization threat with brook trout in the Upper Priest River watershed. Assess significance of brook trout hybridization in the Upper Priest River watershed and establish benchmarks to

measure and/or prevent any further increase in the rate of hybridization.

6 Use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats.

6.1 Use partnerships and collaborative processes to protect, maintain, and restore functioning core areas for bull trout.

6.1.1 Support watershed group restoration efforts. Support collaborative efforts by local watershed groups (*e.g.*, Priest Lake Watershed Advisory Group) to accomplish site-specific protection/restoration activities throughout the basin, consistent with this recovery plan and with Cumulative Watershed Effects Assessments already completed in the Binarch, Indian, Kalispell, Lion, Quartz, Reeder, Trapper, and Two Mouth Creeks and in the Upper West Branch and Lower West Branch Priest River watersheds.

6.1.2 Protect habitat. Provide long-term habitat protection on State and private lands through habitat conservation plans, land exchanges, purchase, conservation easements, management plans, and other methods. Initial emphasis should be on identified bull trout spawning and rearing streams in the Upper Priest Lake watershed.

6.1.3 Support habitat protection and monitoring in the Priest Lake State Forest. Work collaboratively with the Idaho Department of Lands and other State agencies and nongovernmental entities to ensure that bull trout habitat is protected and enhanced in drainages on the east side of the Priest Lake watershed (where tributary habitat is generally more suitable for bull trout than on the west side due to underlying geology).

6.1.4 Develop Priest Lakes partnerships. Initiate a Citizens Advisory Group of anglers, homeowners, stakeholders, and other interested parties to assess potential solutions to the immigration of lake trout

into Upper Priest Lake. Work with local organizations and individuals to establish fisheries management objectives for Priest Lakes that accommodate the potential to reach bull trout recovery goals and minimize the migration of lake trout upstream through the Thorofare into the Upper Priest River watershed. Include discussion of potential options for lake trout reduction in Priest Lake.

6.2 Use existing Federal authorities to conserve and restore bull trout.

6.2.1 Monitor compliance with the Biological Opinion for the Federal Columbia River Power System. Monitor compliance with Biological Opinion of the U.S. Fish and Wildlife Service (USFWS 2000) (Federal Columbia River Power System) related to operation of Albeni Falls Dam on the outlet of Lake Pend Oreille.

6.3 Evaluate enforcement of existing Federal and State habitat protection standards and regulations and evaluate their effectiveness for bull trout conservation.

6.3.1 Fully implement existing State habitat protection laws. Fully implement the Idaho Forest Practices Act, Idaho Lake Protection Act, Idaho Stream Channel Protection Act, Washington Hydraulic Permit approval, Water Quality Standards for Surface Water of the State of Washington (WAC 173-201a), and Washington Forest and Fish program to maximize legal protection of bull trout habitat under State law. Evaluate the effectiveness of these laws and programs in conserving bull trout habitat.

6.3.2 Encourage floodplain protection. Encourage local and State governments to develop, implement, and promote restrictive regulations to protect floodplains and lakeshores in Boundary and Bonner Counties in Idaho and Pend Oreille County in Washington to mitigate habitat loss and stream encroachment from rural residential development throughout the Priest River drainage.

These and other effects of development are of particular concern in watersheds that support bull trout spawning and rearing as they exacerbate temperature problems, increase nutrient loads, decrease bank stability, and alter instream and riparian habitat.

7 *Assess the implementation of bull trout recovery by recovery units and revise recovery unit plans based on evaluations.*